

THE
NATURAL HISTORY REVIEW.

THE
NATURAL HISTORY REVIEW:

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PROCEEDINGS

OF

THE ARMAGH NATURAL HISTORY SOCIETY, THE BELFAST NATURAL HISTORY AND
PHILOSOPHICAL SOCIETY, THE CORK CUVIERIAN SOCIETY, THE DUBLIN
NATURAL HISTORY SOCIETY, THE DUBLIN UNIVERSITY
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- Page 25, 8 line from head, *for* Chrenberg, *read* Ehrenberg.
,, 29, 23 ,, ,, indistinct ,, distinct.
,, 39, 12 ,, ,, medical ,, Vegetable.
,, 55, 6 ,, ,, is ,, in.
,, 59, 3 line from foot ,, 21 ,, 51.
,, 76, 13 ,, head ,, Trinchomenus *read* Anchomenus.
-

PROCEEDINGS OF SOCIETIES—

- Page 53, Foot note, the references are inverted.
,, 54, 17 line from head, *for* bicolor *read* bicolon.
,, 57, 16 ,, ,, Aphidæ *read* Apidæ.
,, ,, 34 ,, ,, muxologicorum *read* mycologicum.
,, ,, 6 ,, foot ,, Cryptogammarum *read* Cryptogammicarum.
,, 58, 13 ,, head ,, Hepnum *read* Hypnum.
,, 60, 8 ,, ,, ,, bicolor ,, bicolon.
,, 62, 26 ,, ,, ,, mouth ,, front.
,, 118, 4 ,, foot ,, definitely ,, definitively.
,, 119, 20 ,, head ,, arenosus ,, arenarius.
,, 124, 23 ,, ,, ,, bicolor ,, bicolon.

Reviews.

THE BUTTERFLIES OF GREAT BRITAIN. By J. O. Westwood, F.L.S., &c.
With coloured Plates. 8vo. London: W. S. Orr and Co., Paternoster-row. 1855. Price 15s.

WE have read of two good hermits who lived together, and never fell out, until, weary of being so unlike the rest of mankind, they agreed together to have a quarrel as other men had; but, being unused to the thing, no better way occurred to these simple-hearted men than to place a stone between them, and for one to say, "This is mine," and the other, "Nay, it is mine;" and so they hoped to get up a quarrel. The present work bids fair to rival the reputation of the stone in the legend, though it is not the ownership, but the age, of the book which is the grave subject of debate. Mr. Bladon, on its appearance, rises up and says, "This is an old book;" and Mr. Westwood says, "Nay, it is a new book;" and so they have got up a very pretty dispute for the columns of the "Athenæum." The end of the hermits' quarrel may not be inapropos—"Well, brother, if it be thine, then take it;" "and so," adds the historian, "they could not quarrel, having been so long accustomed to peace." Whether the fraternity of entomologists be as peaceful naturally as that of the hermits, let those who sit in the seat of the judges decide. The joke of the matter is, that in this case the dispute was settled ere it was begun. "It is an old book," says Mr. Bladon. "The proprietor of the work, entitled 'British Butterflies and their Transformations,' and 'British Moths and their Transformations,'" says Mr. Westwood, in the first words of his preface, "having determined to *re-issue* the former," &c. One calls it an old book, the other a re-issue. What are they fighting about, then? "If it be old, brother, why, then, it is old." "Nay, brother, if it be a re-issue, then it is a re-issue." Much ado about nothing. The truth is, it is a new edition, considerably improved, with certain valuable additions, and the results of the experience of the years that have elapsed since its first appearance. At the same time, in order to reduce the bulk and price of the work, many omissions have been made, but not of "any important or necessary information." We commend the story of the hermits to the consideration of the combatants, and retire ourselves from the lists, with the single remark,

that, whether old or new, our relish for the present work was not destroyed by the possession of the original one.

The principal variations from the first edition are—1st, A much more full introduction, “containing the general characteristics of the butterfly tribes in greater detail than in the original work;” 2ndly, An entirely fresh set of plates, drawn by the author, which, however, scarcely equal the other in finish or accuracy of colouring; 3rdly, “Two elementary plates, devoted to the illustration of the general characteristics of the butterfly tribes, and containing a great number of microscopical details, both of their perfect and preparatory states, which, in conjunction with the full description given of these two plates, it is hoped, will be of great service to the entomological tyro,” which, we think, will fulfil the hopes of the author, and deserve to do so; 4thly, The Index Expurgatorius, at the end, is greatly increased; in the first edition, it was modest, and contained but six species; it now numbers no less than forty-three, among which figure many species admitted into the original work, but now regarded as doubtful, or only varieties of other species. This index in the re-issue takes the form of an “Appendix of reputed British Butterflies.” Besides these, there are admitted of greater precision—*e.g.*, *Pieris Chariclea*, *P. Metra*, and *P. Sabellica* are treated as *undoubted* varieties of *Brassicæ*, *Rapæ*, and *Napi* respectively; while in the former edition it was left in each case, at many minor alterations in the body of the work, as advanced science least, an open question. One error, however, and an amusing one, has been left unaltered, and has even, with one author at least (Mr. Morris), been regarded as an authority. We are told that *G. Rhamni* varies from 2 inches to $3\frac{1}{2}$ inches in expansion of the wings—*i.e.*, it sometimes attains a size exceeding by $\frac{3}{4}$ ths of an inch the largest dimensions given for *P. Brassicæ*, and equals the average of *P. Machaon*, which is said to vary from 3 inches to 3 and *nearly* $\frac{3}{4}$ ths. The blunder arose from a misconception of Stephens’s description, “2 inc. 3—6 lines—*i.e.*, from 2 inches 3 lines to 2 inches 6 lines. That Mr. Westwood should have not only made the mistake at first, but repeated it in the re-issue, is odd enough; but that Mr. Morris should have deliberately adopted it is truly surprising.

The introduction in the present edition is divided into six sections, of which the original introduction forms the first, while the fifth consists of “directions for collecting and rearing caterpillars and preserving the perfect insect,” mainly taken from the chapter on that subject, appended by Mr. Humphreys to the original edition. The remaining sections are new, and greatly enhance the general interest of the work. The second is headed “Characters of the Rhopalocera, Lepidoptera, Diurna, or Butterflies in

general," but contains very little information, merely stating that many of our native species are very beautiful, though³ not rivals to the tropical species, and alluding to the interest excited by the fact—no less wonderful, truly, for being known to most—that the transformations of butterflies are but successive rejections of its outward skin by an animal always one and the same in all stages of its existence.

The general characters of the Imago are treated of in section third, which contains an outline of the principal features of their external anatomy, and the general structure, neurulation, and clothing of the wings, with much interesting information about the scales, especially those recently discovered to be peculiar to the males of various species of *Diurna*, belonging to the genera *Pieris*, *Argynnis*, *Hipparchia*, and *Polyommatus*, and "chiefly found in those species of which the males have the upper surface of the fore wings ornamented with patches of velvet-like hairs." Several figures of these "male scales" are given in the second of the two elementary plates, and are very curious. In the close of the section, Mr. Westwood observes, that the variations in the flight of the different species and tribes have been as yet but slightly investigated. We should be glad to see more attention paid to this subject, as it may not improbably prove of considerable value, and it is difficult to see why a well-defined variation in the modes of flight should not be as important as a difference of structure, on which, indeed, such variations often depend. It may probably be pretty safely affirmed that no two species of our native *Diurna* have exactly the same kind of flight; and a careful observation and record of their variations would be at once interesting and instructive, and would, at any rate, save the young collector the trouble of many a laborious chase, ending in fruitless capture. We speak from experience and the memory of past years.

Section four is devoted to "the preparatory states of Diurnal Lepidoptera," giving a general sketch of the progress of the insect from the egg to the imago, illustrations of which, from Sepp and Herold, are found in elementary plate B.

Section six is a description of the two elementary plates, consisting of details of the perfect and preparatory states of butterflies, and forming an important and valuable addition to the work.

"In this introduction," says Mr. Westwood, "I have embodied the results of a very minute and microscopical examination of a vast number of species, which had been rendered necessary for my completion of the great work on the genera of Diurnal Lepidoptera, commenced by Mr. Edward Doubleday, and in which several important characters, hitherto

almost or entirely neglected by the lepidopterists, were examined in detail—such as the structure of the palpi and fore legs, the veining of the wings, the articulation of the antennæ, the ungues and their appendages, and the external marks of distinction between the sexes in the different groups. Many of these neglected characters were found to be of great value, not only as indicating family and generic, but often specific distinctions.” Such is the introduction, which, as being the great novelty of the re-issue, has received a more detailed notice. We have reason to congratulate the students, for whose sake this addition has been made, on the decided improvement in the constitution of “the old book.”

With regard to the species excluded from the re-issue, though there are as many as seventeen, of which descriptions and, in nearly all cases, figures were given in the original work, there are but four which were admitted as unquestionably genuine. These are—*P. Podalirius*, *M. Dia*, *H. Briseis*, and *C. Hero*. The supplemental plate given in the former edition is also omitted. The beauty of the book, as a book, is, perhaps, somewhat diminished by these extensive omissions; but its practical utility is but little impaired, and this is more than made up for by the additional matter which the author has, by these means, been enabled to introduce, while greatly reducing the size and price of the book.

The bulk of the work, consisting of descriptions of, and observations on, the various species, remains as it was, except where the difference of the specimens figured renders some change necessary, or additional observations are inserted when fresh light has been thrown on any point, as occasionally happens—*e.g.*, under *Colias Edusa*, mention is made of the two vars. considered by Stephens as *C. Chrysothema* and *C. Myrmidone*, both of which were allowed distinct places in the original work, the latter as having some claims to be considered as British; and in the remarks on the genus *Melitæa* additional reasons are given for adhering to the usual division of the *Fritillaries* into the two genera *Melitæa* and *Argynnis*, instead of several sub-genera, as suggested by the author. Here and there we find traces of a too lax revision of the original letter-press where minor changes were necessary, as, where we read in the old edition—“The number of British species of this genus (*Pieris*) has been the subject of much recent inquiry, it having, *until within the last fifteen years*, been considered that there were but three. In 1827, however, Mr. Stephens increased the number to seven,” &c., which is all very well in a work published, according to the title-page, in 1841; but when we find the same words reproduced verbatim in a book published in 1855, the effect is not so good, and would be rather puzzling to one who never saw the first edition, and

had learnt a few elementary lessons in arithmetic. A little ordinary care would have prevented such oversights as this, which impart an appearance of haste and slovenliness, by no means advantageous to such a work as the present professes to be.

As for the plates, we do not, on the whole, think them an advance on the prior edition; they are sometimes harshly executed, though these are the exceptions, and occasionally they even have the advantage of their predecessors. The desire of economizing both space and price has sometimes, also, we think, carried the author too far—*e.g.*, so fine and striking an insect as *Aporia crataegi*, and such a rarity as *P. daplidice*, deserve more than a half-view of the under side (which is all we are favoured with), especially while we have full-sized portraits of much commoner and in no way striking insects, as *Pieris Brassicæ*, &c. On the other hand, we have several interesting figures of gynandromorphous specimens, particularly a most remarkable one of *Argynnis paphia*, which mingles not only the male and female characters, but those, also, of the type and the variety. Such figures add greatly to the interest of the work.

Although, therefore, taken as a whole, this book is but a re-issue, it presents many of the features and possesses many of the advantages of a new work; and, in spite of sundry incidental defects, it may be considered as representing the latest, most matured, and, therefore, most valuable opinions of a man than whom few could be found more competent to discharge the office which he has here undertaken, and, we doubt not, it will be appreciated accordingly.

In taking leave we would suggest to Mr. Westwood that he would confer a great benefit on British entomologists if he would subject the remaining volumes of the original work—viz., *British Moths and their Transformations*—to the same process of revision and re-issue through which the butterflies have passed. He would find much more to do in that field, of which our knowledge has increased more rapidly, because, probably, there was more to be known—consequently, more changes have taken place, and a more complete work than we, as yet, possess, is somewhat imperatively called for. We sincerely hope that the success of his recent labours will be such as to encourage him to go through with the re-issue, and that speedily.

POPULAR BRITISH CONCHOLOGY; A Familiar History of the Molluses Inhabiting the British Isles. By George Brettingham Sowerby, F.L.S., Author of "Manual of Conchology," &c., &c. London: Lovell Reeve. 1854. With twenty Coloured Plates. Royal 16mo. Price 10s. 6d.

THE work before us is essentially popular in its character and design, and may be considered to form one of a series of such works from time to time appearing, some of which have already received notice in our pages. Useful and attractive, they serve greatly to lessen the apparent repulsiveness of long scientific descriptions and tedious research, which, in former days, were the only means of gaining any insight into nature's works, and which still must continue the single path for scaling the high eminence of real distinction in scientific knowledge.

Mr. Sowerby opens with a very brief preface, in which we are informed that he adopts, without hesitation or reserve, the scientific arrangement of the classes, orders, and genera given by Messrs. Forbes and Hanley, in their great work on British mollusca; having announced which fact, he speedily commences his work, proceeding to enumerate the British species under each genus, and to interweave with the descriptions many of the most interesting details that can be collected in regard to the economy of each. *Scientific* descriptions he has entirely waived, and in their place he mentions of each of the species any peculiarity, whether of form or colour, that may be calculated to strike the eye; indeed they are mostly those signs by which naturalists are wont to discriminate the species as they see them cast upon the shore, although not, in many cases, the really distinctive characters of each.

In one point, however, which would have been no small assistance to his readers, the author has shown a strange neglect—we mean in hardly ever alluding to the *comparative size* of different species, either in the descriptions or figures; some of the more minute are represented in the plates by highly-magnified figures, some of the larger on a diminished scale, while others appear their natural size. But how, under the circumstances, any one previously unacquainted with the subject is intended to identify the shells, we are at a loss to imagine.

Moreover, we must notice another fault in the work, which might still more easily have been avoided; it is the wide separation of the plates from the descriptions of the species figured in them. It is our opinion that it would have been better to collect them all together at the end, than that Plate X., facing page 136, should relate to the shells mentioned from page 69 to page 74; while Plate XI. might, with more convenience to the reader, have taken the place of Plate VI.

Yet, notwithstanding these faults, which we have felt it our duty not to pass over, we consider this work well calculated to have a good effect in arousing a taste for so interesting a study as that of our native shells, and of their inhabitants more especially. The figures are accurately drawn, and very fairly coloured; besides which, the reader will find at the end some useful explanations of scientific terms, incomprehensible to many at first sight, though, it may be, rather more necessary than our author seems willing to acknowledge.

Gladly as we would spend a little longer in reviewing the very pleasing subject before us, and in telling our readers of each lovely form or more instructive story that rises to our sight as we turn from page to page, it is here our place to conclude; therefore, with our best wishes for its success, we would close at once both our book and our review.

YOUNG NATURALIST'S LIBRARY—BEAUTIFUL BUTTERFLIES; BRITISH SPECIES. By H. G. Adams, author of "Nests and Eggs of Familiar British Birds," &c., &c. London: Groombridge and Sons. Price 1s.

IN these days of cheap literature we are not often arrested by the low price of a book, but, in this case, we were, at the first sight; and, having read it, confess that we should call it singularly cheap at double the money. Written for the young—the *very* young, we should say, from the overdone childishness which peeps out here and there under the plea of simplicity and entertainment—it is, in the main, admirably adapted for the end designed—"to fasten and encourage in the minds of the young a taste for the study of natural history, to lead them to a close examination of the wonderful works of the Creator, and to teach them how to read the great book of nature." We get, for our shilling, a good introduction of twenty-six pages on the history of a butterfly, its preparatory states, the more prominent features of its structure in all of them, with several nicely-executed illustrations in the margin, and a liberal seasoning of poetry to boot, which, to say the worst, cannot do any harm; coloured figures and descriptions of twenty-two species of native butterflies—the figures, if we mistake not, after Mr. Morris, of whom the author is a devoted admirer and, may we say without offence, occasionally an imitator in points where imitation had better been avoided; sixty pages are devoted to the descriptions of these species. Lastly, we have a list of all the British species, with the scientific name, time of appearance, and place of resort of each—the last particular too generally treated to be of much use; and under

"Time of Appearance," we find such entries as "very rare," "only one taken," &c.; still we approve of the table on the whole—the idea is very good.

The author, Mr. H. G. Adams, is fond of hunting out derivations, and the origin of names, &c., which are sometimes far-fetched, as the derivation of *Machaon*, from "the Latin *Machera*, a dagger or knife" (he might have said the Greek at once, from which the Latin adopted it), in allusion to the pointed tails of the insect; and the name of the comma butterfly from the "outline of the wings, which, forming the kind of curve presented by the stop called a comma, gave occasion to the name." Oddly enough, in the very next sentence he gives the true derivation while accounting for the addition "*album*," which we should have thought so plain as to need no comment, much less to excuse such a recondite absurdity as we have just quoted. These are minutiae which we can laugh at and pass by; the little book has a good aim, and is well written, is uncommonly cheap, nicely got up, and has our hearty commendation and recommendation.

Ere passing from the subject, we may inform our readers that this little book is one of a series of similarly cheap and illustrated works now being issued by Mr. Adams, two of which have already appeared—one on *British Birds' Nests, and their Eggs*, the other on *Mollusca*. Some of these we hope to give an account of on a future occasion.

READING LESSONS. First Book. Edited by Edward Hughes, Head Master of the Royal Naval Lower School, Greenwich Hospital. Longman, Brown, Green, and Longman.

MR. HUGHES is already well known to the public as a successful writer on educational subjects. His excellent "*Outlines of Physical Geography*," and "*Scripture Geography and History*," need no commendation of ours to make them better known to those who are engaged in the arduous and responsible work of education. One of the prominent features of this age is the effort which is made in every quarter to imbue the minds of the young with a knowledge of scientific subjects. There exists, in fact, a *rage* for scientific education, and in this, as in every similar instance where there is a great public desire to be satisfied, abundant opportunity is given to quacks and pretenders of every kind to palm off on the unsuspecting their spurious wares. There exists at present an anxious and, we think, a reasonable desire to appoint a commission to examine "*Adulterations of*

Food;" would it not be well, following out this idea, to institute a kindred commission, whose duty it shall be to investigate "Adulteration of Knowledge?" Is it more culpable, we ask, to put copper in our pickles, or blue vitriol in our bread, than to supply the minds of the rising generation with wrong ideas or false information? To adulterate a book is, in our opinion, no less a crime against society than to adulterate our food. We, therefore, hail with pleasure the appearance of Mr. Hughes's Reading-book; in his good intentions, and in his thorough experience as a teacher, we have, at least to some extent, a guarantee that no deleterious element is to be found in the food he offers, and that we may, with safety, put his books into the hands of our youth.

Mr. Hughes's object is, no doubt, a good one; how well or how ill he may have accomplished it cannot well be told until the series be completed. A review, however, of his first volume may serve to encourage him in the prosecution of his useful labour, and, at the same time, warn him against the dangers to which a project such as his is peculiarly liable. His reading lessons—comprising, as they do, so great a variety of subjects—may be compared with a cyclopædia; and who is it that does not know the difficulties and dangers of such an undertaking? No man, be his learning or information ever so extensive, is competent to write on every branch of knowledge, to delineate *παιδεία* in all its parts—he must call in the aid of others; and although he may preface each man's performance with his name, the responsibility of the work, as a whole, must, nevertheless, fall upon him—his reputation must depend on the character and reputation of those with whom he may associate himself. What judgment, then—what determination—what discrimination of character—will he not require to carry him safe through his arduous undertaking? His work is like that of an engineer engaged in some ponderous construction—every rod and beam, every bolt, nut, and screw, must be looked to with an experienced and suspicious eye; no part of his material is good until it be thoroughly tested and examined; his production, in fact, is a striking instance of the maxim that "nothing is stronger than its weakest part." Mr. Hughes himself seems to have some such idea of his work; his "well-considered plan," as he states in his preface, is "to make each book of the series a complete *platform* of knowledge, upon which the mind may, as it were, rest, and take a general view before ascending to a higher stage." What becomes of the platform if it have a faulty plank—or, rather, beam—just at the point where the weight most needs support? In this consists the danger peculiarly incidental to his task, and through which we would desire to see him safe.

The subjects discussed in this volume present great variety. We have an excellent article from Mr. Hughes's pen on physical geography, a subject on which he is so well qualified to write. The form of the globe on which we live, its dimensions, the mode of ascertaining these, the relative amount of land and water, their distribution, &c., all these questions, so capable of being laid before the minds of boys in a simple and entertaining form, are treated in a manner worthy of the author's former reputation. These lessons, with their excellent wood-cut illustrations, and interesting facts, form a most pleasing feature of the book.

Mr. Edward Purcell—his able coadjutor, we understand, in the Lower Naval School—has contributed two articles; one on practical mechanics, of which it is not our intention to speak, the other on mental culture; on this subject, notwithstanding its rather metaphysical aspect, it does come within the proper province of this review to speak. "How to get Knowledge," and "How to Observe," two of the questions discussed, are, and must always be, of prime importance to every student of nature. These lessons are written in a pleasing, familiar style; the suggestions which are intended to guide us in our search after truth are, in the main, judicious, and such as have evidently proceeded from a thoughtful man, himself accustomed to follow the thread in Nature's labyrinth. If we were to venture on criticism, might we not say that matter of this kind is, perhaps, one grade too high for boys? On this, however, we shall not insist, as in the class-room there are often found, even at an age which we may think unfavourable to reflection, individuals of a thoughtful cast, who may, perhaps, derive nutriment and growth from such mental food.

The next lesson, or lessons, to which we shall advert are by Mr. J. B. Jukes, on a subject of quite another character—geology. Here we have an opportunity of laying facts—facts, too, of the most interesting nature—before the youthful mind. What boy is there who will not be glad to learn something more about the earth, which, with Mr. Hughes, he has already circumnavigated and measured? Of what stuff it is made—how this stuff comes to be where we find it—whether laid down by water or protruded upwards by the agency of unruly subterranean fire. Not only how these layers and mountains of stuff differ in material, but how they may be proved, by the interesting remains of animal and vegetable life, to belong to different ages of the world, suited by atmospheric and other conditions to different stages of organic existence. On casting our eye over Mr. Jukes's production we confess we felt somewhat disappointed; three out of his four lessons seemed to be taken up with a description of minerals, their composition, form, colour, degrees of hardness, &c.—a sub-

ject, to say the least of it, not calculated to engage the attention of boys, and certainly, if at all properly handled, not level with their capacity. One chapter we have on rocks, in which, as a matter of course, we are told the difference of aqueous, igneous, and metamorphic rocks, but not a word about a fossil—not so much even as to lead the boy who reads of geology to know what the great business of geology is—namely, from the exuvia of defunct species of animals and vegetables to trace out the ages, groupings, and relative positions of the rocks which lie apparently in such utter confusion on the earth's surface.

Let us now return, no matter how unsatisfactory the task may be, and examine whether this food provided for the sustenance and growth of the youthful mind is merely insipid and innutritive, or whether it may not contain some noxious ingredient—whether, in fact, the baker has not put alum or plaster of Paris in our bread.

The author begins by cautioning his boy-reader against the exploded error of the old philosophers, who taught the existence of four elements—earth, air, fire, and water; and informs him that, in the present state of chemical knowledge, we believe in upwards of sixty elementary bodies, which he proceeds to classify. Our reader, perhaps, expects to find the old-fashioned division of metalloids and metals, of the metals into alkalies, alkaline earth, earths, &c.; if so, he will be disappointed, perhaps not justly. We all know the extreme difficulty which so frequently recurs in the natural sciences of accurate and scientific division. We all know, for instance, the doubt that is felt in placing magnesian with the alkaline earths, rather than with the earths—in considering arsenic as a metal, rather than a metalloid, isomorphous with phosphorus. And if this be so, why should not Mr. Jukes be allowed the privilege of proposing a new classification? His division is three-fold; we quote his words—"First of all, there are all the pure metals—such as gold, silver, iron, lead, copper, tin, antimony, manganese, zinc, and a great many others which do not ordinarily occur; secondly, there are six substances, called sulphur, phosphorus, carbon, silicon, boron, and selenium; and, lastly, there are seven substances which, when pure, are always found in the state of gas, or aeriform fluid; these are called oxygen, hydrogen, nitrogen, iodine, chlorine, bromine, and fluorine."

We can readily conceive the astonishment of the chemist who reads this page; but for the sake of the general reader, and lest any mistake arise, we shall enter into particulars. We are told that iodine, is a gas; on referring to "Turner's Chemistry," we find it described as "a soft, friable opaque *solid*, of a bluish-black colour, and metallic lustre; it occurs usually

in crystalline scales, having the appearance of micaceous iron ore." Bromine, too, we are told, is a gas; this Turner tells us "is a *liquid*, the colour of which is blackish red," and that it is three times heavier than water. The gaseous nature of fluorine also is dogmatically taught, although every one that has learned chemistry knows that the properties of this substance, in an insulated state, are not known, and that Baudrimont's imperfect guesses on the subject are all we have.

Are these lessons intended to be the boy's first introduction to the Temple of Science, or merely as interesting summaries of what he may have learned before in the lecture-room of his school? In the former case the boy believes all that he is told, and then we have to contemplate the melancholy picture of his pure mind being burthened with three—at any rate two—grievous errors, almost before he takes his first step. In the latter case, if the effects be not so positively injurious, they are, at least, confusing. Which of the two is the boy to believe—his lecturer, who exhibits a bluish-black solid in one phial, and a dark red fluid in another, calling one iodine and the other bromine, or the so-called leader of science, who pronounces them both gases?

We are exhorted by an ancient moralist to reverence youth. The duty is incumbent in intellectual no less than in moral culture. A single error or careless statement uttered before a boy tends to check his mental growth just as much as an indecent word or a pernicious doctrine to ruin his morals. We have dwelt, perhaps, too long upon this topic, and shall, therefore, pass over, without criticism, the other parts of this absurd attempt at classification. A single error in a book should not procure its condemnation—it may occur through inadvertence, through haste in transcribing, or some cause difficult to explain. The fact of its being an error of this pardonable kind is not unfrequently proved by a correct statement of the same thing in the next paragraph or next page. Can this be the case in the present instance? the reader may ask. We regret to say that it is not so. The next paragraph shows the error to be deliberate; and the remainder of the article abounds in errors which it would be difficult, in the same number of pages, to parallel in any other book that ever saw the light. We shall dismiss the subject by briefly noticing those which are most prominent in the order in which they occur.

Iron pyrites is called a sulphuret of iron; it is a bi-sulphuret.

"Although each mineral has one simple crystalline form, yet that form admits of many modifications, according to the ways in which it may be split or cleaved." This statement is altogether erroneous, although it is commonly believed by sciolists.

“Potash and soda both occur native.” Not only is this untrue, but the nature of these substances forbids the possibility of its being true.

“Common salt,” we are told, “is formed by the combination of soda with hydrochloric acid, or muriatic acid, as it is sometimes called.” This is also untrue; common salt is composed of the metal sodium and the metalloid chlorine.

“Alabaster and plaster of Paris are made of gypsum.” Plaster of Paris is an article of manufacture, alabaster is not.

“Fluor-spar—the beautiful mineral called blue-john in Derbyshire—is fluorate of lime.” Such a substance as is here described is unknown to chemists; the mineral spoken of is fluoride of calcium.

Alum is spoken of as a substance “of which there are many varieties, all combinations of alumina and sulphuric acid, together with other matters. Common alum is a sulphate of alumina.” A rare substance, called “feather alum,” is a sulphate of alumina. Common alum is a sulphate of potash *plus* a ter-sulphate of alumina.

Silicates of magnesia are represented as “all easily melted by the heat of the flame of a blow-pipe.” The exact reverse is the case; they are, in general, most refractory substances, and can never be fused, except in cases where they include abundance of lime or iron.

“They (the metals) are commonly combined either with oxygen or with some of the various acids—such as the sulphuric, the carbonic, or the nitric.” No mention whatever is made of sulphur and arsenic, the great companions of the metals; and, as for the acids, we need not refer the reader to works on metallurgy or mineralogy to prove the well-known fact, that the metals are only *sometimes* combined with carbonic, but *rarely* with sulphuric, and *never* with nitric acid.

Meteoric stones are said to contain, as well as iron, “almost invariably a small proportion of the rarer metal (nickel) combined with sulphuric acid.” This is not only untrue, but impossible.

“Copper is not unfrequently met with native, but not often in any considerable quantities.” There is a specimen from Cornwall, in the hall of the Museum, in Jermyn-street, with which our author should be familiar, which weighs some tons; and at Lake Superior native copper exists in great abundance, and is worked with profit.

We have done with our unpleasant labours, and greatly regret, for the sake of Mr. Hughes's series, that in its first volume an article should have occurred which is so bad as to be past mending in a second edition. We can see no remedy but in its removal; it is a case for the surgeons; no cure but complete excision. With pleasure we turn to an article,

somewhat farther on, in the book by Mr. Tyndall, of the Royal Institution. The subject treated is "Natural Philosophy." This gives the writer a wide range; and, therefore, as his space is limited, he must choose a few subjects to illustrate his views. We confess we were charmed with the lucidity of his style, his clearness of thought, and vivid illustrations. It is well for Mr. Hughes that, if mistakes be made in one part of his series, we can often find their correction in another. Thus, in Mr. Tyndall's prefatory remarks on Natural Phenomena, and those agencies called forces, by writers on Physics, we get a rational account of what the "cleavage of minerals" means. When common salt is referred to, for the sake of illustration, its composition is correctly given. Of the subjects he selects for treatment, we shall not speak much, as they do not properly fall within our province; but we cannot refrain from saying, that he has succeeded, to a marvellous degree, in making plain and simple that difficult elementary notion in dynamics—viz., that the force which exists in a body in motion is measured by mass \times velocity, or by its momentum, as Newton defined it. We have alluded to the vividness of his illustrations; we cannot omit the following, which is most felicitous. He is speaking of the impact of two equal and perfectly elastic balls, moving in opposite directions, with the same velocity:—"If, for example, each ball possessed a velocity of nine feet a second before impact, this velocity is not only destroyed in each case, but is converted into one in the opposite direction; and in this case it is usual to say that the loss of velocity is doubled. I know that this will appear a new notion of loss to many boys, inasmuch as the *absolute velocities* after impact are the same as before. The case may be illustrated by a parliamentary candidate, who reckons on the support of a certain voter; if the voter dies, the candidate may be said to lose a vote; but if the voter change his opinion, as our ball has changed its direction, and votes for the opposition candidate, then the loss may be said to be doubled."

A MANUAL OF MARINE ZOOLOGY FOR THE BRITISH ISLES. By Philip Henry Gosse, A.L.S. Part I. Pp. 204. Price 7s. 6d. London: John Van Voorst, Paternoster-row. 1855.

BRITAIN is a favoured country so far as natural history is concerned. Monographs on various subjects connected with the natural sciences are continually pouring from its press, and, with all this, her naturalists are still bringing before our notice new forms and new species, plucked from the world of chaos, and proving to us how much is still to be done in these

sea-girt isles of ours, and showing us the folly of sighing for other worlds to conquer.

And its natural history is not confined to the few and to the learned, but is daily becoming the study of the many, and they are beginning—it may be by slow degrees, but yet surely—to find it sweet to look round them, and behold the things which a bountiful Creator has strewed in living perfection about them, and of which, when he had made them, he pronounced to be very good; and when man takes an interest in any of God's creation, he delights to place upon it some token by which he may talk of it to others; and hence he gives to it a name. It was early in the world's history, while man reigned by himself in Paradise, that the beasts of the field, the fowls of the air, and every living creature, appeared in one long array before him, and Adam gave to them all a name. Would that that nomenclature was still extant, and then we should be able to know and to recognise all creation, and be freed from the Babel that modern men's devices have raised.

And now let us suppose that an inquirer, one who wishes to know somewhat of the animated nature of this our native land, should apply to us to know how he was to discover what names had been attached to the objects of his search, we would direct him to the many and costly monographs that have from time to time made their appearance, and tell him he would get the information he needed in some one of them. Oh! but, he might say, I want some single volume that may contain, in a condensed form, all the instruction that I need. Surely, if Linnaeus wrote a *Systema Naturæ* meant for the whole world, some of our many naturalists have done the same kind office for this much smaller world of ours; and until but very recently we should, albeit reluctantly, have answered him in the negative, and told him to wait for some better time.

But now we can introduce to the notice of such inquirers as these the book which stands at the head of our notice. Previously we told them of monographs, whose very perfection put them far beyond their reach; now we can tell them of a manual whose chief perfection is, that it will be within the reach of all, that the tyro, or even the more advanced student, may, with the greatest ease, carry in his pocket, and refer to as he sits upon the weed-fringed rock, or stands upon the tide-washed shore.

This manual of British Marine Zoology is the production of a naturalist well-known to our readers, whether they think of him as the sojourner in the Bluefields of Jamaica, under the shade of the calabash trees, or by the sea-coast and the rock-pools of sunny Devonshire. View him as we may, we still see the genuine naturalist, one who woos Nature in her own

retreats, and wishes others to do so also ; hence the publication of the present work, which is to be completed in two parts, the first of which is before us.

“ Knowing,” says our author, “ by experience the difficulties which lie in the way of identifying animals by published characters, I have laboured to remove or to lessen these difficulties as far as was possible. I have endeavoured to make these pages *practically* useful to the beginner, while yet they should be precise enough to serve the advanced zoologist as a convenient medium of reference ; and I believe the student will find here the means of learning, with as little trouble and doubt as possible, the generic name of *every animal* that has been recognised by naturalists as inhabiting the British seas, from the lowest sponge up to the whale ; and it is not only upon descriptions that the student has to rely, but he has also for his assistance figures, the majority of which are striking as faithful likenesses of the animals they represent.” Indeed this is one of the most remarkable features of the present work, that while it is published at so very small a price, it should yet be most copious in the number of illustrations, containing figures of no less than three hundred and forty species (a figure of every genus named), of which one hundred and thirty are drawn from *living* and one hundred and two from preserved specimens, the remainder being copies from Johnston, Forbes, and others. We do, indeed, acquit the author of all vainglory when he affirms that upwards of one hundred figures, taken from living animals in these low forms, constitute a somewhat unusual feature in a book of this size and price.

The part before us contains the following classes :—I. Poriphora ; II. Infusoria ; III. Rhizopoda ; IV. Zoophyta ; V. Acalepha ; VI. Echinodermata ; VII. Turbellaria ; VIII. Annelida ; IX. Rotifera ; X. Crustacea ; XI. Cirripedia ; XII. Arachnida ; and, XIII. Insecta. In the synopsis of the classes which part two is to contain, we find, greatly to our surprise, that the class Aves is to be omitted. Why leave out the birds, and include the insects ? Surely many of the former have their home, almost always, in the great deep ? Ask the stormy petrel where its home is. It would, doubtless, say on the crest of the briny wave. We will not deny that it visits, and that often, the dry land ; but if so, why we should convict *Aepus marinus* of constantly doing the same. And, then, we have known the *Saxicava*—and, we presume, it will be included in part two—have its hiding-place but a little below the nesting-place of some of the to-be-neglected class—Aves. We would ask Mr. Gosse to reconsider the subject. Our opinion is, that British marine zoology will be incomplete without the addition of this very interesting class.

And now having acted the part of champions for the “Birdies fair,” in order that they may be *included* in the future part, we must also defend the right of some smaller fry that have been *excluded* from the present part. If we turn to the 178th page, we find that of all the classes that come under marine zoology, that of Insecta is the smallest in respect of numbers. We are aware that of this—the most populous class, beyond all comparison, of animals, embracing as it does more than ten times as many species as all other living beings put together—the sea is singularly destitute. It has, indeed, been frequently said that no true insect is marine; and, though this is not literally true, the minuteness of the exception makes the rule even more striking than it would have been if absolutely universal. Of the hundreds of thousands of insects known to exist, but *two*, says Mr. Gosse, live in the sea. Now, if we can help it, this solitary pair shall no more pine alone; for, we fancy, we shall be able to add to this small band, at least, *two pair* more.

We would sincerely wish for Mr. Gosse’s company as far as the Portrane sands, not far from Dublin, where we would show him one, at least, of the two pair; but, meanwhile, we must tell him of them, and this shall be done in the words of an entomologist of whom we are justly proud, and who was the discoverer of one of the insects:—“I found,” says Mr. Haliday, “*Cillenum laterale* under stones, near *low-water* mark. They prey upon the sand-hoppers, and the tide retiring has scarcely uncovered the sand, when these little depredators are abroad from their hiding-places, and alert in the chase.” We forbear to quote more of this interesting history; but Mr. Gosse will find it in No. 18 of the “Entomological Magazine” for January, 1837.

In company with the *Cillenum*, Mr. Haliday discovered a new and singular minute brachelytrous insect, which he has described under the name of *Diglossa mersa*, and which is, like its companion, buried beneath the ocean surge on every incoming tide. (A description of its larva will be found, with a figure, at page 116, of the “Natural History Review,” vol. ii., Proceedings of Societies.) So far for the first pair, which have often come beneath our notice.

Mr. Spence, if we mistake not, also tells us of two of the coleoptera having very similar habits—namely, *Pogonus Burrellii*—the habitation of which is entirely covered, during the winter and part of the summer months, with water; and *Bledius tricornis*, which inhabits the sand-hills near the sea at Ely, in Norfolk, and also the North Bull sands, near Dublin.

The Rev. G. Rudd, writing in the “Entomological Magazine” for April, 1834, on the habits of *Hesperophilus arenarius*, says—“I saw great flights

of this insect alighting below high-water mark. The tide rolled on, covered the sands, with all their inhabitants, and again receded. I disturbed the little insects in their retreat; they were as lively as if they had been sporting in the sunshine." This species is abundant at Baldoyle, near Dublin, in the same localities as the *Cillenum* and *Diglossa*. We hope to see these, and it may, probably, be others with them, added to the list of Mr. Gosse's *Marine Insecta*, in the shape of an appendix.

In making these remarks we have considered that every animal that is dependent on the salt-water for its sustenance—in fact, that cannot live without its presence—has a right to be included in a *Manual of Marine Zoology*. We know it is difficult to draw a line of demarcation; but we think it would be better, if necessary to err at all, to do so on the safe side.

When part two makes its appearance we shall return once more, and notice the present one; and we would now take our leave of it, assuring our readers, that as a *Manual of British Marine Zoology*, it need fear no rival; as a sea-side book, it will be the constant companion of the student of nature, who will find it a most useful work. We prophecy a long run of prosperity to it, and hope the author will have frequent occasion, as new editions make their appearance, of keeping its contents up to the standard of the day.

CATALOGUE OF THE BEES OF GREAT BRITAIN. By Frederick Smith, M.E.S.
Printed by Order of the Trustees of the British Museum. 8vo. London.
1855, with ten plates. Price 6s.

TWENTY years of intimacy—for so far back, as he has told us himself, do his continuous observations date—have eminently qualified the author to commend to his readers a theme in itself attractive—

"The bee with honied thigh,
That at her flowery work doth sing."

—(exquisite picture of cheerful industry!) does not the very name conjure up fragrant memories of long bright days of delicious summer, of childhood's pastime, and the fresh face of smiling nature. Bees—blithe, busy bees, thrifty withal, and valiant in the defence of your well-earned store and darling brood—we, too, have heard your carol, have watched you, too, at rosy morn, and noon, and dewy eve, with interest and curiosity that have grown and ripened since that early moral lesson by thee sug-

gested, little busy bee, was lisped in artless rhyme, till such time as the tomes of Reaumur, of Huber, or of Kirby, wiled us from repose, and lighted up again the waning hours, then sent us forth, with the return of day, in the fields and woodlands, to verify the more than fabulous wonders and yet unexhausted secrets of your true history. Where the garden blends gay colours and grateful scents in voluptuous profusion, there ye are found; in open forest glades, and deep-hollowed lanes, where the full gush of concentrated sunshine reverberates from the wayside bank, searching every nook and cranny, and flooding all with genial warmth and brilliance, there your countless dwellings are, populous cities of Troglodytes. Free commoners of nature, yours, too, is the wide range of purple heather mantling the mountain slope far above the track of the gleaming ploughshare, high aloft beyond the murky veil that wraps the clanking forges, and the atmosphere of carking cares hanging about the marts of human traffic; where the skylark's song is silent and the chirrup of the grasshopper, and no voice awakes the quivering ether but your glad hum, unless it be the mellow tinkle of a sheep-bell, or the low gurgle of some tiny brook, treading its way unseen among huge, moss-clad stones, or that the distant boom of mighty ocean may come up, stealing faintly, as a ghost of sound, upon the uncertain ear. We welcome you, winged elves of the realm of flowers, and your historian, who comes to tell us of your families and kin, to teach your proper names, particular tastes and qualities. For, among bees, there are many shades and diversities of instinct; not all alike exemplify the character, moral and poetical, that is conventionally attributed to the race at large. There are domestic bees and wild, social and solitary, honey bees and parasites. Man's wholesale pillage indeed is limited, in this country, to one species, the highest in the scale of instinct and intelligence; but many others bear witness also to the poetical truth, that

Vos non vobis mellificatis, apes.

It is gratifying, however, to have such incontestable authority as Mr. Smith has adduced, to clear the reputation of sundry families of bees from the unmerited charge of setting up an establishment for self and family, without working, at the cost of their more industrious neighbours. Appearances indeed were against some of them, but our author teaches us that appearances are deceitful: "Observation alone can be relied upon, when the history of an insect is to be written; all classification, based upon structural differences alone, will frequently be at fault." On behalf of the whole family *Andrenidæ* the general plea is put in "not guilty." "The

result of my observations," Mr. Smith declares, "leads to the conclusion that no species of the *Andrenidæ* is parasitic." Indeed, the genus *Prosopis* was the only one against which grave suspicions of this nature were, till lately, entertained, resting, as it appears, upon no stronger evidence than their being destitute of the usual apparatus for collecting pollen. The first person that had a word to say for them, as we are informed, was Mr. Thwaites, who bred two species from bramble-sticks, in which the larvæ were found arranged in the same regular order as is the case with the acknowledged working bees.

Mr. Smith, from his own observations, also has vindicated the industrious habits of *Sphecodes* against Lepelletier St. Fargeau's imputation of parasitism, almost unnecessarily we think, since that hypothesis was framed in disregard of the distinct testimony of such accurate observers as Reaumur and Kirby. Concerning the kindred *Halicti*, Kirby has simply said, "the insects of this family nidificate much in the same manner with those of the preceding (*Sphecodes*) in bare banks."

Among the genuine bees (*Apidæ*) the genus *Ceratina* has been qualified as parasitic by St. Fargeau, again in opposition to the express statement of Spiniola, the correctness of which has been confirmed by the late observations of Thwaites and of our author. They construct their cells, like *Prosopis*, in the dead shoots of brambles. The veritable parasites belong to the genera *Nomada*, *Epeolus*, *Cælioxys*, *Stelis*, and *Melecta*, composing the tribe *Cuculinæ* of Latreille. The *Apathi*, also, are known to live, on a rather ambiguous footing, in the nests of the humble-bees (*Bombi*), which they resemble so closely. We will leave Mr. Smith to state the case for them, as he will make the best of it—

"What office these bees perform in the economy of the nest has not been discovered; they live on the most friendly terms with the industrious part of the community, and it is probable that upon them devolves some important office, the nature of which it would be very interesting to discover. It has been supposed, from the very close resemblance of the *Apathi* to the *Bombi*, that the former are an idle race, reared at the expense of the industrious bees, and wearing a livery in imitation of them, for the purpose of deception; but there can be little doubt of these aristocrats of the community performing important and necessary duties highly conducive to the general prosperity of the whole. That the close resemblance of these bees is not for the purpose of deception is at once proved by the fact of *A. Barbutellus*, a yellow-banded bee, being found in the nest of *B. Derhamellus*, a black species having the tip of the body red; and we have already seen that, amongst the solitary bees, the greatest difference in appearance exists; we would instance *Epeolus* and *Colletes*, *Andrena* and *Nomada*, also *Melecta* and *Anthophora*."

But, in truth, these same humble-bees are a much-enduring race of drudges, as many a schoolboy can testify, who has learned to "pluck the

honeybag o' the bee," before his acquaintance with the sweets of Shakspeare's Muse has gone much further. We turn to Kirby's homely, but faithful, picture of their awkward feats in the science of self-defence. "When these animals are walking upon the ground, if a finger be moved to them, they lift up the three legs of one side to defend themselves, which gives them a very grotesque appearance." Mr. Smith has noticed more particularly—

"The various degrees of pugnacity which they exhibit when their dominions are invaded; the moss-builders exhibit little or no courage in the defence of their citadel, they may be taken with impunity; but a far different race are those which build underground; these are bold and daring insects, which defend their nests with great courage.

"The term moss-builders must not be taken literally, since many nests are composed entirely of grass and leaves; but in situations where moss is plentiful, the nests will be found to be constructed entirely of that material. To show that humble-bees avail themselves of such materials as are most readily found, and suitable to their purpose, I may instance a very remarkable nest found near a farm-house. One of the brown species of humble-bees was observed frequently flying into a stable through the latticed window; the bee was busily engaged in collecting bundles of short horse-hair accumulated from the currying of horses; this she flew off with to a short distance, and settled down with it amongst some grass; on examining the spot, a nest composed entirely of horse-hair was discovered; this interesting nest was destroyed before the bee had quite completed its construction. Another very interesting deviation from the usual economy of the moss-building bees was observed by Dr. William Bell. During the summer of 1854, a robin built its nest in the porch of his cottage at Putney; some time after this had been observed, an humble-bee took possession of the nest, and adapted it to her own purpose; he was, unfortunately, unable to identify the species by capturing a specimen, the nest having been destroyed; but Dr. Bell saw the bee on one occasion, and observed that it was black with yellow bands, probably *Bombus pratorum*."

The economy of the "cuckoo-bees" has been hitherto so imperfectly investigated, that Mr. Smith may justly claim credit for the additional materials he has contributed towards their biography. Of the *Nomadæ*, the most numerous in species among the parasitic genera, we have the following account:—

"The bees belonging to this genus are popularly known by the name of wasp-bees, from their close resemblance, in their gay colouring, to the smaller species of Vespidae; they are, however, true bees, and constitute the most beautiful of all the genera found in this country; notwithstanding the generally-received history of their economy, we shall search in vain for much precise information. . . . No one appears to know anything beyond the mere fact of their entering the burrows of Andrenidæ and Apidæ, except that they are found in the cells of the working bees in their perfect condition; it is most probable that they deposit on the provision laid up by the working-bee, that they close up the cell, and that the working-bee, finding an egg deposited, commences a fresh cell for her own progeny. My reason for thinking it probable that the parasite closes the cell is, that I have frequently captured *Nomadæ* and *Melectæ* with masses of clay attached to their posterior tibiae; and in the well-known genus of exotic parasitic bees, *Crocisa*, specimens are of frequent occurrence which have masses of clay or mixed earth on their tibiae; this, however, requires, and is deserving of, further investigation. I have found several of the species in the cells of *Andrenidæ*—these will

be mentioned under the respective species. It is, however, necessary to record one instance which throws some light upon the economy of the genus. Some years ago, in the month of June, I met with a large colony of *Eucera longicornis*, and observed great numbers of *Nomada sexfasciata* flying about amongst the bees, and occasionally entering into and issuing from their burrows. In the beginning of April of the following year I visited the locality for the purpose of obtaining males of the *Nomada*, as very few were found when the colony was first discovered; the cells of *Eucera* were found at about the depth of eight inches in a stiff clayey soil; of these a considerable number were obtained; on examination, many of the bees were found to be in the pupa state, some far advanced towards their perfect condition, others still larvæ; on opening one cell, it was found to contain two specimens of *Nomada sexfasciata*. Since the former visit I have, on several occasions, obtained the cells of *Eucera*, and have endeavoured to find the larva of *Nomada*, but in vain; perfect individuals of *N. sexfasciata* have been found in the cells of *Eucera* on several occasions, usually two in each cell, and once a pair of *N. alternata*."

Of *Epeolus variegatus*, again (the only indigenous species of this genus), the author informs us—

"This pretty little bee is very abundant in many parts of Kent, Surrey, and Hampshire; it is also met with at Southend, in Essex; it is, however, local; wherever *Colletes Daviesana* is found, *Epeolus*, its parasite, is to be met with; it has been found in the burrows of that bee. It usually appears early in July; the males pass a great portion of their time reposing in flowers, particularly on the heads of the ragwort; they are also partial to the mouse-ear hawkweed, and may frequently be found enclosed in the petals of the flowers; the habit of this bee is very sluggish; they are easily captured by hand; their sting is very acute."

The preceding extracts may give some idea of the Natural History touches which are interspersed among the descriptive portions of the volume, so abundantly, that there is scarcely one, except the rarest species, with regard to which Mr. Smith has not some particulars to communicate. Having drawn so freely already from the source, we will venture to extract only one more bit of biography before we proceed to the technical details, indispensable in reviewing a work of such scientific character—

"If I were asked which genus of bees would afford the most abundant materials for an essay on the diversity of instinct, I should, without hesitation, point out the genus *Osmia*. I propose to notice in this place all that has occurred to me during an attentive observation of their economy for the last twenty years. Mr. Kirby, in the '*Monographia Apum Angliæ*,' has quoted the history of Reaumur's mason-bee, which, although not included in the present genus, is still so nearly allied that its history might be taken as a parallel to that of *Osmia*; but as it is not a British species, I merely allude to it to call attention to the highly-interesting history given by Reaumur of its economy. The most abundant species is *Osmia bicornis*; its economy is varied by circumstances; in hilly country, or at the sea-side, it chooses the sunny side of cliffs or sandy banks, in which to form its burrows; but in cultivated districts, particularly if the soil be clayey, it selects a decaying tree, preferring the stump of an old willow; it lays up a store of pollen and honey for the larvæ, which, when full-grown, spin a tough, dark brown cocoon, in which they remain in the larva state until the autumn, when the majority change to pupæ, and soon arrive at their perfect condition; many, however, pass the winter in the larva state. In attempting to account for so remarkable a circumstance, all must be conjecture, but it is not of unfrequent occurrence; this species, also, frequently makes its burrows in the mortar of old walls. *Osmia leucomelana* may be observed availing itself of a most admirable, and almost ready, adaptation for a

burrow ; it selects the dead branches of the common bramble ; with little labour the parent bee removes the pith, usually to the length of from five to six inches ; at the end she deposits the requisite quantity of food, which she closes in with a substance resembling masticated leaves—evidently vegetable matter ; she usually forms five or six cells in one bramble-stick. The bee does not extract the whole of the pith, but alternately widens and contracts the diameter of the tube, each contraction marking the end of a cell. The egg is deposited on the food immediately before closing up the cell ; it is white, oblong, and about the size and shape of a caraway-seed. The larva is hatched in about eight days, and feeds about ten or twelve, when it is full-grown ; it then spins a thin silken covering, and remains in an inactive state until the following spring, when it undergoes its transformations, and appears usually in the month of June.

“*Osmia hirta* burrows in wood, seldom in any other material ; the same habit will be observed in *Osmia ænea* ; but I have observed this bee more than once constructing its burrow in the mortar of walls, and sometimes in hard sandbanks. *Osmia aurulenta* and *O. bicolor* are bees which commonly burrow in banks, the latter being very abundant, and forming colonies in some situations ; but although it appears to be the natural habit of these species to construct tunnels in hard banks, with great labour and untiring perseverance, still we find them at times exhibiting an amount of sagacity, and a degree of knowledge, that at once dispels the idea of their actions being the result of a mere blind instinct, impelling them in one un-deviating course. A moment's consideration will suffice to call to mind many tunnels and tubes ready formed, which would appear to be admirably adapted for the purposes of the bee—for instance, the straws of a thatch, and many reeds ; and what could be more admirably adapted to their requirements than the tubes of many shells ? So thinks the bee. *O. aurulenta* and *O. bicolor* both select the shells of *Helix hortensis* and *H. nemoralis* ; the shells of these snails are, of course, very abundant, and lie half-hidden beneath grass, mosses, and plants ; the bees finding them in such situations, dispense with their accustomed labour, and take possession of the deserted shells. The number of cells varies according to the length of the whorl of the shell selected, the usual number being four, but in some instances they construct five or six, commencing at the end of the whorl ; a suitable supply of pollen and honey is collected, an egg deposited, and a partition formed of abraded vegetable matter ; the process is repeated until the requisite number is formed, when the whole is most carefully protected by closing up the entrance with small pellets of clay, sticks, and pebbles ; these are firmly cemented together with some glutinous matter, and the bee has finished her task.

“We will now observe the intelligence of the bee under different circumstances. She has selected the adult shell of *Helix aspersa* ; the whorl of this species is much larger in diameter than that of *H. nemoralis* or *H. hortensis*—too wide, in fact, for a single cell ; our little architect, never at a loss, readily adapts it to her purpose by forming two cells side by side, and as she advances towards the entrance of the whorl, it becomes too wide even for this contrivance ; here let us admire the ingenuity of this little creature ; she constructs a couple of cells transversely ! And this is the little animal which has been so blindly slandered as being a mere machine.

“I will take this opportunity of correcting a very widely-diffused error, which appears to have originated with Reaumur ; or, if his account of the development of *Xylocopa* be correct, it differs from that of every wood-boring bee which inhabits this country. He says—‘When the larva assumes the pupa, it is placed in its cell with its head downwards ; a very wise precaution, for thus it is prevented, when it has attained to its perfect state and is eager to emerge into day, from making its way out upwards, and disturbing the tenants of the superincumbent cells, who, being of later date each than its neighbour below stairs, are not yet quite ready to go into public.’ Mr. Kirby also quotes from a letter by the Rev. George Ashby, who, after describing the nest of *Megachile centuncularis*, says—‘The lowest and first born passes out through the bottom of its own (lowest) cell, and so escapes without disturbing the rest, who are not yet ready to emigrate.’ All such conclusions originate in conjecture. In the case of *Osmia aurulenta* constructing her cells in the spiral tube of a snail's shell, where is the possibility of

escape? when burrowing in a sand-bank the same difficulty presents itself; when *Chelostoma florissomnis* avails itself of the tube of a straw or reed, how is the insect to pass the first knot which opposes its escape? Such are the results of theoretical conclusions; let us seek for knowledge in the careful investigation of the operations of nature.

“A bee is observed to alight on an upright post, or other wood suitable for its purposes; she commences the formation of her tunnel—not by excavating downwards, as she would be incommoded by the dust and rubbish which she removes—no, she works upwards, and so avoids such an inconvenience. When she has proceeded to the length required, she proceeds in a horizontal direction to the outside of the post, and now her operations are continued downwards; she constructs a cell near the bottom of the tube, a second, and a third, and so on to the required number; the larvæ, when full fed, have their heads turned upwards; the bees which arrive at their perfect condition—or, rather, those which are first anxious to escape into day—are two or three in the upper cells; these are males; the females are usually ten or twelve days later. This is the history of every wood-boring bee which I have bred, and I have reared broods of nearly every species indigenous to the country. I have observed in the instance of *Chelostoma florissomnis*, that whilst one bee was carrying on her operations as detailed above, another was tunneling in a horizontal rail; here no lower opening was required, the bee pushed the chips out at the entrance, and as no outlet was necessary at the end of the tunnel, the bee in this ease made none.

“There is still another species of this genus whose habits are so different to the rest, that our admiration of the ingenuity of these bees is greatly increased when we consider its curious details, and reflect upon the degree of care and foresight exhibited by the provident parent—this is the *Osmia parietina*, a bee only found in the northern parts of this country. This species selects the underside of a slate or stone lying on the ground, and having a hollow space beneath; to the stone the bee attaches the little balls of pollen. A stone of this kind was found at Glen Almond, Perthshire, on the Grampians, 800 feet above the level of the sea, by Mr. J. Robertson, who, on turning it up, observed a mass of cocoons; although he was not much acquainted with entomology, still he knew them to be the production of some insect; he presented the stone to the British Museum, and it was placed in my hands for observation. The size of the stone was ten inches by six; the number of cocoons attached to it two hundred and thirty. When first discovered, about one-third of them were empty; this was in the month of November. In the beginning of the following March, a few males made their appearance, and shortly afterwards some females; they continued to come forth occasionally until the end of June; at this time there remained thirty-five undeveloped cocoons; on opening one or two of them, they proved to contain active larvæ; these I carefully elosed, and left the whole undisturbed until the following April, at which time, on examination, they proved to be still in the larva state; but at the end of May they changed to pupæ, and about the end of June began to come forth perfect insects. This, then, was the result—a portion of a deposit of eggs made in 1849 had been three years in arriving at maturity: when found, one-third were developed; the following year a second brood came forth, and whilst in my possession a third. In the first instance, the whole deposit was subject to the same influences, and had produced larvæ; what was the cause of the retarded development of the rest, it were vain to attempt to determine.”

We cannot but respect the modesty that has left untouched those higher problems of system and philosophy, on which the undying fame of the “*Monographia Apum Angliæ*” mainly rests. After the lapse of more than half a century, and when the peaceful and honoured age of the Patriarch of Entomology in Britain has sunk into the grave (the evening that precedes sunrise), the groups, and the disposition of them which he has indicated, still form the groundwork for the arrangement of these families; while the

very discrepant and boldly original views which Lepelletier St. Fargeau has more lately proposed appear to have gained few converts. But still after that, much remained, which could hardly be accomplished by a work produced at a time when war had almost wholly interrupted the communications with the Continent, then, at the best, and for long after, tardy and precarious in matters of literature—produced, too, from materials nearly limited to his private collections and observations, made in the leisure hours of a life consecrated then, as it was afterwards, for a period exceeding the average duration of human life, to the duties of the ministry in a country parish. Kirby himself was aware of many imperfections in his own work. Of the last of his groups he has remarked—"I know no family of which it is more difficult to distinguish the species than the present, for there is little difference in the form of the *Bombinatrices*, and the hue of their bodies, at least of all our English ones, is the same, so that the describer must rely almost solely upon the colour of their hirsuties for his characters, and this is so subject to vary, even in the same individual in different periods of its existence, that it is not safe to depend upon it, but under particular restrictions. An insect recently disclosed, in this respect appears a different species from the same where it has long been exposed to wind and weather." And again—"But this is not all the difficulty with which the describer has to struggle; the males, in general, resemble the females sufficiently to be known as such, but there are several so unlike them, as to be easily mistaken for different species; and I am by no means certain that I have not, in more instances than one, described the sexes under different names; till all can be traced to their nidi this is not easy to be avoided."* Such instances as are here anticipated have afforded scope accordingly for correction by further observation. Large additions, too, have accrued to the list of indigenous species through the industry of collectors, during the fifty years, and upwards, that have passed since Kirby wrote. And while collections have increased and multiplied at home, the growing facilities of communication with the Continent, and the interchange by traffic of scientific publications, have tended to disseminate the literature of the science, and to harmonize the nomenclature. Mr. Smith has availed himself with judgment and ability of these advantages, for the production of a volume which may be considered a necessary supplement to those of Kirby. It might seem, at first sight, that little had been added, in respect of numbers, since the commencement of this century; two hundred and twenty-one species having been given by

* *Monographia Apum Angliæ* I. 207, 208.

Kirby, at that time, as indigenous, while Smith's Catalogue embraces two hundred and six only. The actual additions among these, however, amount to seventy; four, treated by Kirby as mere varieties, have had their right acknowledged to specific distinction; and three out of his list are excluded as of exotic origin.* The resulting disparity is to be explained by more extended observation having eliminated many supposed species as mere differences of sex, and by the reduction to their proper specific type of many of the varieties which are apt to arise from the wearing away and bleaching of the pubescence through age or accident. Let us take for an example the group of bees to which Kirby's remarks above quoted directly applied. Under the first of these, *Bombus muscorum*, Mr. Smith remarks—

“Having included seven of the species of our great monographer in that of *B. muscorum*, I must observe that it has not been done without having repeatedly examined the communities of a large number of nests; in some, all the varieties described were found; in different nests, one or other of the varieties will usually be the most numerous; in nests found in the north of England, the variety *B. agrorum* is much more numerous than in the west. This species is found in all parts of the United Kingdom, and is undoubtedly the true *A. muscorum* of Linnaeus: the typical specimen preserved in the cabinet at the Linnean Society is a female.”

The specific marks to which Audouin first directed attention have been employed by Mr. Smith to fix the species of this difficult genus found in Britain. The result has been that while four species, unknown to Kirby, have been added since, his original list has been reduced from thirty species to fourteen, retained in the pages of Smith. Of the parasitic genus *Cælioxys*, on the other hand, of which Kirby actually knew but one species (for his *C. inermis* would seem to be but a male variety of the first), four more have been since discovered in Britain.

Kirby, as various notices in the Monographia show, had not neglected to consult the authentic specimens of Linnaeus, which had become the property of his accomplished friend, Sir J. E. Smith, not very long before; but he did not deem it necessary to follow out the consequences so rigidly as later authors have done; and many of those notes remained forgotten or unregarded, until Mr. Smith resuscitated, and enlarged them, by a fresh collation of the Linnean types, which has led to the restoration or corrected application of several of his trivial names. Thus the *Sphex gibba* of Linnaeus, appropriated by Scopoli (whom most later authors have implicitly followed in this) to a genuine Linnean *Sphex*, now *Pompilus*, is properly recognised as a bee *Sphecodes gibbus*. And while *Apis retusa*

* *Apis violacea*, *A. pollinaria*, *A. druriella*.

of Kirby appears as *acervorum* Fabr., an *Anthophora* unknown to Sweden, where Kirby's *A. haworthana* is common, this last is proved, by a reference to the authentic original, to be the true *Apis retusa* of Linnæus. The common yellow-tailed and yellow-banded humble-bee* turns out to be the *A. terrestris* of Linnæus, while the nearly similar bee, with a white tail, that has been more generally considered as such, is identified as the female of his *A. lucorum*, a male with different marking. The results of a scrupulous examination, by Dr. Nylander, of the collection in the University of Kiel, have been, in like manner, made available for the more certain identification of the species which Fabricius had described. The strict application by Mr. Smith of the rule, that where the sexes of one species have been contemporaneously described as distinct, the trivial name given to the male should have the preference, has led to some changes in the commonly received nomenclature. So *Calioxys conica* sinks in the *quadridentata*; *Apis bicornis* L. is found under *Osmia rufa*, *A. cærulescens* L. under *Osmia ænea*, and *A. ursina* K. as a synonym of *Panurgus banksianus*.

It seems to be tacitly assumed by the author that the reader comes prepared by the previous study of Kirby's Monograph, and Westwood's Modern Classification, as regards the families and their primary subdivisions, since no characters of these are given in the Catalogue. For the aggregate group ANTHOPHILA, or bees in the widest sense, including both the families, *Andrenidæ* and *Apidæ*, we are, indeed, provided at the outset with a sort of Natural Character. We feel no sort of doubt that Mr. Smith can tell a bee at sight, with unerring certainty; but we do greatly mis-doubt whether the author himself, or his readers either, would be enabled to distinguish the same from (almost) any other winged Hymenopterous insect of the section Aculeate, by means of any or all of the structural characters there given, unless it be the single one, which is specifically invalidated by exceptions. It may be said to be of little moment; *how* we know—*so* we know; if so, commend us then to the life-like pictures of Sturm or Curtis for our study, in place of the painful poring over crabbed phrases. Nevertheless, it is not a difficult matter, in fact, to know a bee from all the rest of the Hymenoptera; but that *by* means of characters, not *without* them, by definite marks, and a peculiar aggregate of them, not by such as are vague, or common, or applicable but partially.

* Not just a corruption of humming-bee, as Mr. Smith conjectures; but of much older origin, since all the branches of the Teutonic stock have got the name in forms little altered; Dutch *Hommel* *by*; Swedish *Humla* (*bi*); Danish *Humle-bi*; German *Hummel* (*biene*), &c.

Of the plates, ten in number, one-half are devoted to exemplify the varying forms of the oral organs, which are of so much moment for generic division in these families. The rest present examples of the principal genera, with the veining of the wings, and other details of structure. The eye of the entomologist has guided the hand of the artist here; and these illustrations are calculated to please more generally than Kirby's own rude, but instructive, etchings. The generic characters, which the plates seem to elucidate, are drawn up with care and neatness, without unnecessary diffuseness. The veining of the wings has been made to afford the ground for a natural subdivision of the extensive genus *Andrena*, to which Kirby had confessed himself unable to discover any clue. In the delineation of the species, we are glad to see that Mr. Smith has adhered to the good old Linnean pattern, neither swelling out the diagnosis to the amplitude of a description, nor wholly dispensing with it, as has been done by some late Monographers, whose merits, in other respects, have been of the highest order. It is easier to give a good diffuse description than a *good* concise one, but the apt construction of the diagnosis is the hardest test of all such skill.

In conclusion, we would say that this Catalogue, whether as a manual of reference for naming a collection, or a pocket-companion on entomological rambles, may be considered as indispensable to every one intending to collect and study the British bees.

MOLLUSCA TESTACEA MARIUM BRITANNICORUM. A History of the British Marine Testaceous Mollusca, Distributed in their Natural Order on the Basis of the Organization of the Animals, with Reference and Notes on every British Species. By William Clark. London: John Van Voorst. 1855. 8vo. Pp. 536. Price 15s.

THERE is, says Adanson, in his "History of the Shells of Senegal," published one hundred years since, something more to consider in shell-fish besides their shells. The animal that inhabits them should guide our methodical arrangements—should be our only regulator—since it is the principal part, and that which gives to the shell its form, size, hardness, colours, and all the other peculiarities in it which we admire so much. Though by no means subscribing to the truth of the above extract, we have quoted it for the purpose of introducing to our readers' notice the volume on British Marine Testaceous Mollusca, by William Clark, who, in some particulars at least, might be called the Michel Adanson of the present century. Our

space will not permit us to enter into details, or to write a history of all that has been said and done for conchology or malacology, from the time that Aristotle, with unwearied industry, and ever-to-be-admired ingenuity, tracked out for himself a path in this neglected desert, down to our days, when this desert has become a fruitful field, and names like Cuvier, and Blainville, Milne-Edwards, Müller, Owen, and our ever-to-be-lamented, but never-to-be-forgotten, Forbes, with a whole host of others, stand like beacon-lights, showing us the broad, distinct track which each and all have left behind them, some few shining steadily, with an enduring brightness—while other of the lights but flicker and die; and others still shine, like the light-house on a barren rock, but to show us where danger lies, and to warn us off the coast. For, truly, to again quote from Adanson, the details of the study is, by no means, childish play; far from it; but the way thereto is a thorny one, and beset with much difficulty.

In our opinion, the fate of malacologists and conchologists must be very like, indeed. Finding fault, as they almost invariably do, with the systems of their predecessors, they found some new one of their own, which, in its turn, shall, perchance, be stigmatized by some fresh candidate for the withering laurel, as so much ingenious trifling, supposing he gives it no harder name.

Now, it must be well known to our readers that, since the year 1757, when the “History of the Shell-fish of Senegal” was published, and even before that date, naturalists, at least the major part of them, have, in the study of shells and their inhabitants, fallen into one or the other of two extremes—by either describing the shell as if it had no inhabitant, or else describing that inhabitant as if it had no house of its own wherein to live in; and as each successive naturalist glides slowly into either of them, he is called (as in the former case) a conchologist, or (as in the latter) a malacologist. To the latter of these divisions the author of this volume most unquestionably belongs; one extract will prove this, if it be not already known. Under the head of *Littorina rudis*, in page 342, we find the following synonymic list:—

- L. patula*, Brit. Moll., iii., p. 36.
- L. tenebrosa*, Brit. Moll., iii., p. 39.
- L. saxatilis*, Brit. Moll., iii., p. 43.
- L. fabalis*, Brit. Moll., iii., p. 49.
- L. palliata*, Brit. Moll., iii., p. 51.
- L. gonaria*, *L. nidissima*, *L. jugosa*, *L. neglecta*, Auct.

and the following reason why it is given—“To describe the above, which are the pseudo-species of authors, would be to say, that the *organs* of all, both external and internal, do not vary in the slightest degree in

form." Now, we do not mean to query the truth of this reform among the Littorinidæ; they, undoubtedly, wanted some change. We know that one of the authors of the British Mollusca was of opinion that some of the species above quoted might be varieties of each other; *but still* we cannot say we are quite satisfied at some eighteen or nineteen pages of Messrs. Forbes and Hanley's works being so very roughly handled, particularly by an author who seems hardly to be aware of when he has made up his mind upon a subject, and when, for all we know to the contrary, we may find him at some future time telling us that, on *reconsideration* of the subject, he has found himself unable to make two species out of one.

We do not wish to be harsh in our criticism of this book, but there is about it an undigested look, which detracts much from its value as a scientific work, and much from its author's reputation as a modern malacologist. Many of the memoirs in this volume have been published in the "Annals of Natural History" from time to time, and are reprinted in exactly the same form as they appeared in that journal; so that, when opportunities presented themselves of examining the mollusc, and mistakes were discovered, they, instead of being incorporated in the text, are appended to it; and hence we are frequently annoyed, after reading the account of an animal, to find just at its close the words "since the above was written;" and then follow statements that not unfrequently are diametrically opposite to the ones we have been perusing. A curious instance of this occurs in the author's description of the branchiæ of Pandora obtusa. We find in the British mollusca of Forbes and Hanley, a note, by Mr. Clark, stating that this animal possesses "two palpi, one branchial lamina, and (perhaps) an obsolete one, on each side of the body;" but as fresh specimens were examined, we find that (see p. 151 of the present work) he can now say, beyond dispute (*sic*), that there are two palpi and two branchiæ on each side, and that he has preparations that can prove it; whilst in the appendix, in spite of saying and proving, our author returns to his original opinion! For our author's credit, we may say, *en passant*, that this is the worst case our ingenuity could find; but we do meet, and that frequently, with cases where old opinions are made, and that without ceremony, coolly to give place to new ones. Now, new or old, which is the reader to patronize?

The system followed is based on sexual organization; and following his predecessors in this method (for it is, by no means, of Mr. Clark's devising), he gives us the following divisions:—Hermaphrodita sine concubitu, Hermaphrodita sine congressu, Hermaphrodita congressu, (and here we find the Trochidæ: what will malacologists say to this?), and, lastly, Bisexual—the most obvious meaning of this latter word is the very

opposite to what it is used by Mr. Clark to represent in this division of the mollusca.

Perhaps the most astounding portion of this work is the part devoted to the Muricidæ. Here we find the well-known genera, Buccinum, Fusus, Pleurotoma, Purpura, Nassa, Trichotropis, and Cerethiopsis, all placed under the one genus—Murex. No difficulty is there in believing that this must be an enormous genus, when the shores of Great Britain itself affords so many antiquated (?) genera—so many species. We perfectly agree with the author when he, on reviewing this awful ruin caused by his own hand, says it will be hard to cast off these old names. Yes; hard it will be—so very hard, that we must declare our intention to follow the bent of our inclinations in retaining them, though old, and though, as Mr. Clark says, they represent objects without the *slightest* generic *pretension*.

In conclusion, we would say that this work is not a history of *all* the British mollusca, but only of those that came beneath Mr. Clark's notice in the southern part of Devonshire; and, as it is illustrated with no figures, it remains yet to be seen whether our author's description, as he fondly imagines, will more than take their place.

Notwithstanding its defects—notwithstanding what its author might call our prejudices—we must, and we do it willingly, record our opinion that this volume is a most important addition to our British Malacology; it contains a vast amount of valuable observations, and is a work that must be consulted by any future British naturalist who will write upon this subject. The crudeness of our author is almost atoned for by his industry; and his manifest inclination to record his observations for the benefit of others, is deserving of our highest esteem; at the same time, we would observe that in order to do malacology a good service, our author should cling less devotedly to those dicta with which this work abounds.

Obituary.

GEORGE JOHNSTON, M.D., EDINBURGH.

WITHIN the last twelve months, when fire and the sword have been slaying their thousands on the battle-field of a foreign land, the grim arm of death has not been less vigilant in this, our native soil. Already have we penned the brief tribute of respect to one whose talents and kindness of disposition raised him high among the admired of mankind; and now we

are called upon to record the departure from among us of another of our most distinguished members.

George Johnston was born on the 20th of July, 1797, at Simprin, in Berwickshire. About the year 1813 he commenced his medical studies in Edinburgh, and entered as a pupil of the well-known Dr. Abercrombie. He took out his degree of M.D. in 1819, and soon afterwards became a Fellow of the Royal College of Surgeons of Edinburgh. He then removed to Berwick, where he established himself as a physician, and was not long in becoming one of the leading medical men of that town. He devoted himself with the greatest assiduity to the duties of his profession; and we believe that he never completely recovered from a severe wetting to which he was exposed while visiting a patient in the country. He sought, in the retreat afforded by the Bridge of Allen, some slight relaxation from the harassing duties that devolved upon him, and it was here that he was attacked with a fit of paralysis. He was quickly removed to his residence at Berwick, where he shortly afterwards fell into a state of unconsciousness, which lasted, with a few and brief intervals, until, on the morning of the 30th July, he calmly passed from the scene of his labours.

Thus was finished the life of a great as well as a good man. Dr. Johnston was essentially a British naturalist—perhaps we had better said that Dr. Johnston was the naturalist of the Eastern Border; for, although the author of the “British Zoophytes and Sponges,” yet he always felt, to quote Southey’s words, “The better, as well as the happier, for local attachment;” and one of the most charming productions in the English language is his “Botany of the Eastern Borders.” Some months since, he informed us that the second volume of his “Terra Lindisfarnensis” was nearly ready. Let us hope that some one will be found to follow up the work that our lamented friend had begun.

The driest details became interesting when they flowed from Dr. Johnston’s pen. Ever forward in the pursuit of the natural sciences, he lost no opportunity of advancing their interests, and to this we owe the formation, about two-and-twenty years since, of the Berwickshire Naturalists Club. Some of the excursions of this club will be found narrated by his poetical pen in the pages of his last work, just referred to. His favourite flower was the wood sorrel (*Oxalis acetosella*). Well may we say with Wordsworth, that—

“A flower is not a flower alone—
A thousand sanctities invest it;
And as they form a radiant zone,
Around its simple beauty thrown,
Their magic tints become its own,
As if their spirit had possess’d it.”

THE ANNALS AND MAGAZINE OF NATURAL HISTORY. No. 91, July; No. 92, August; No. 93, September, 1855. 8vo. With Plates. London: Taylor and Francis. Price 2s. 6d. each.

No. 91, July:—(H. J. Carter, Assistant-Surgeon H.C.S. Bombay) Observations on the Development of Gonidia (?) from the cell-contents of the Characeæ, and on the circulation of the mucus-substance of the cell; (S. P. Woodward, F.G.S.) Descriptions of the Animals of certain Genera of Conchifera; (P. H. Gosse, F.L.S.) Notes on some New or Little-known Marine Animals, with two Plates. We have, in this paper, descriptions of nine new animals, two of which belong to the class Arachnida, order Aearina, and are a great addition to our British marine mites. One belongs to the class Crustacea, two to the Annelidæ, two more to the genus *Othonia* of Johnston, and one to the Polyzoa, family Vesiculariadae, for which a new genus is made—*Nolella*, from *nola*, a little bell. (C. Spence Bate, F.L.S.) On the Homologies of the Carapace, and on the structure and function of the Antennæ in Crustacea. After describing the anterior or internal antennæ and the inferior or external antennæ, the author continues:—“The next question which we have to consider is, to which sense either of these two sets of organs belongs; whether the upper belongs to the auditory and the lower to the olfactory, as I shall endeavour to prove, or *vice versa*, as maintained by Prof. Milne-Edwards. We shall divide the evidences on either side under two heads—the first, that which is derived from an external observation; and the second, that which is derived from its internal organization. First, then, from external circumstances:—An auditory apparatus is an organ furnished to an animal for one or both of two objects—first, for protection from danger; second, for the pleasure derivable from sounds. To animals so low in the scale of beings as the Crustacea, placed, as they are, in a medium which must considerably modify its character, sound can convey little to the consciousness of the animal beyond a sense of security or danger. To enable this to be of the most extensive value, the auditory organ must be, and always is, so placed as to be most exposed to external impressions at all periods; particularly when the animal is at rest or pre-occupied. Now, if we look at the organ the present state of science attributes to the sense of hearing, we find that in the most perfectly-formed animals, the *Brachyura*, it is enclosed within a bony case, and secured by a calcareous operculum; that it is always so in a state of rest, and only exposed when especially required. Not only is this the case throughout the order, but in some genera—as *Corystes*, *Cancer*, &c.; it is again covered by the supplying organs of the mouth. If we take into consideration that the inferior antenna is frequently developed into organs assimilating to feet, and frequently used for the purpose of assisting to climb, &c., it seems difficult to admit that it is an organ capable of protecting the animal by its quick detection of the sound of approaching danger. If we turn our attention to the superior antenna, we find that in the living animal it is always elevated in the water, and never at rest—always playing with a constant vibration, and a jerking motion peculiar to itself in the higher orders. Among the Amphipoda, though constantly erect, the motion is more regular and graceful; this, probably, is consequent upon the greater relative length of the organ. This organ is one that appears as if always on the watch—let the animal be at rest, let it be feeding, no

matter, the superior antenna is ever elevated, and on constant guard. Again, if we turn our attention to the land crustacea, we find the organ, as an antenna, disappear; and in *Ligia* and the amphibious *Orchestidæ* they are rudimentary, as if the organ, passing from water into a less dense medium, required modification in order to adapt it to the change of circumstances. If we take into consideration the nature of sound, and its difference of character when conveyed under water from that of passing through air, the obtuse character of the former, which can scarcely be more than a vibratory action of particles of water, which conveys to us a very modified and imperfect idea of sound, we find it difficult to understand that the organ situated at the base of the under antenna is capable of receiving impressions of sound, enclosed as it is within and covered by a stout calcareous operculum. But if we view it as an organ of smell, every objection previously becomes evidence in favour of the idea. The small door, when it is raised, exposes the orifice in a direction pointing to the mouth; this, also, is the direction of the same organ in all the higher orders. In Amphipoda it is directed inwards and forwards. In every animal it is so situated that it is impossible for any food to be conveyed into the mouth without passing under this organ, and of this the animal has the power to judge its suitability for food by raising the operculum at will, and exposing to it the hidden organ—the olfactory. If we turn to the upper antenna, we find that its position, form, and power, are as capable of fulfilling the office of conducting the sensation of sound, as the lower is that of smell. As I before observed, it is always placed erect, and continually feeling in the water for the first approximation of sensation. The filamentary appendages are always two or more, one of which is supplied with singularly-delicate membraneous cilia, being apparently prolongations of a similar membrane to that which covers the larger orifice of the olfactory organ. These lengthened and delicate cilia are peculiarly adapted to receive and convey the most minute vibratory sensation of the medium in which they are suspended. These organs, when spoken of, may conveniently be designated as auditory cilia, and have been found in every species of Crustacea that has been searched for them. If we turn our attention to the internal structure of this antenna, we shall find that it supports the idea of its being an auditory organ more forcibly than its external analysis. In the *Brachyura*, as before observed, the first, or basal articulation is largely developed; if it be removed from its connection with the animal and broken open, the basal articulation will be found occupied by a still smaller chamber, having calcareous walls of a much more delicate character than the integumentary structure. This internal chamber or cell is that which, in this paper, is supposed to be a cochlea, from its analogy, both in its structure and supposed use, to that organ in higher animals. It is situated in the cavity of the basal articulation of the antenna, and attached to the walls furthest from the median line of the crab. It presents a tendency to a spiral form, but passes not beyond the limits of a single convolution. The calcareous walls extend across the axis of the ideal spire, and the internal cavity is one continuous irregular chamber, the walls of which, at the centre of the axis, closely approximate, so as almost to meet. This internal cell represents, we think, the cochlea of higher animals, to which it bears some resemblance both in form and structure. If so, then, beyond dispute, it identifies the superior antenna as an organ of hearing. The internal structure of the inferior antenna differs very materially

from the appearances we have just described. In the *Brachyura*, where the organs are most fully developed, there is attached to the operculum a long, ossous tendon or lever, by which the attached muscles raise or close the entire organ, but there is no internal structure of any kind which could identify it as being an organ of sound. The aqueous sac mentioned by Edwards, I have entirely failed to discover. Viewing the two antennæ each as a whole, in their relative positions and connection with the rest of the animal, we are forcibly led to the conviction that the upper antenna is an organ of hearing, and the lower antenna is an organ of smell." The author's views are illustrated by plates. (M. de Quatrefages) On Double Monstrosity in Fishes. Proceedings of Learned Societies—Linnean Society, December 5, 1854, W. Yarrell, Esq., V.P., in the Chair; December 19, T. Bell, President, in the Chair. Zoological Society, February 14, 1854, Dr. Gray, Vice-President, in the Chair; read, notes on the habits of Indian Birds, by Lieutenant Burgess; February 28, 1854, Dr. Gray, Vice-President, in the Chair. Royal Institution of Great Britain, April 20, 1855., W. R. Grove, M.A., Q.C., F.R.S., Vice-President, in the Chair. Botanical Society of Edinburgh, April 12, 1855, Professor Balfour, President, in the Chair. Miscellaneous—*Nereis bilineata*, by W. Thompson; On a New Species of *Thallasidroma*, by G. R. Gray, F.L.S., and F.Z.S.; On the Eggs of *Otogyps* and *Prosthemadera*, by H. F. Walter. Meteorological Observations and Table for May, 1855.

No. 92, August :—(T. R. Jones, F.G.S.) Notes on Palæozoic Bivalved Entomostraea—No. 1, Some Species of *Beyrichia* from the Upper Silurian Limestones of Scandinavia—with a Plate; (J. W. Griffith, M.D., F.L.S.) On the Conjugation of the Diatomaceæ—with a Plate; (Thomas Wright, M.D., F.R.S.E.) On a New Genus of Fossil *Cidaridæ*, with a synopsis of the species included therein; (T. Horsfield, M.D.) Brief Notices of several New or Little-known Species of Mammalia lately discovered and collected in Nepaul, by Brian Houghton Hodgson; (William Clarke) On the *Assiminia Grayana* and *Rissoa anatina*; (T. Blackwall, F.L.S.) Descriptions of two newly-discovered species of *Araneidea*; (J. Gwyn Jeffreys, F.R.S.) Note on the Descent of Glaciers. No less than five various theories have been proposed to account for the descent of glaciers—1st, by De Saussure, who supposed that glaciers descended solely by their own weight; 2nd, by De Charpentier, and adopted by Agassiz, who supposed that the phenomenon was caused by the surface of the glacier being thawed during the day, that the water thus produced percolated the porous material, and that upon congelation taking place at night, the whole structure expanded in every direction, naturally occasioning or accelerating a downward movement in the direction of the slope; 3rd, that of Professor James Forbes, which attributed it to the viscous or plastic nature of the glaciers, causing the descent *suis viribus*; 4th, that of Mr. Hopkins, who referred the motion of a glacier to the dissolution of the ice in contact with the rock; and, 5th, that of Rev. H. Mosley, who supposed that it was caused by the heat of the sun, and, consequently, to an alternate expansion and contraction of the material. Without either patronizing one or any of these various and seemingly conflicting theories, or attempting to make up "the half dozen," Mr. Jeffreys is of opinion that each and all of the forces above mentioned may have their own part in producing this curious phenomenon; by this means he reconciles the various theorists, and good-naturedly sets at rest this difficult and vexed question.

Bibliographical Notices—Catalogue of British Bees, by F. Smith; Proceedings of the Yorkshire Philosophical Society, vol. i., York, 1855. Proceedings of Learned Societies—Zoological Society, February 28, 1854, Dr. Gray, V.P., in the Chair; March 14, Dr. Gray, V.P., in the Chair; March 28, Dr. Gray, V.P., in the Chair. Botanical Society of Edinburgh, June 14, 1855, Professor Balfour, President, in the Chair. Miscellaneous—On the Organization of the Pedicellate Glands of the Leaf of *Drosera rotundifolia*, by M. A. Trécul; On a New Organ observed in *Callitriche*, by M. A. Chatin; Description of a new Tanager, of the genus *Calliste*, by P. Lutley Selater, M.A.; On the Spermatophora of the Crickets, by C. Lespés. Meteorological Observations and Table for June, 1855.

No. 93, September:—(Professor Steenstrup) Observations on the Genera *Pachybdella* (*Deising*) and *Peltogaster* (*Rathke*), two animal forms parasitic upon the abdomen of Crabs; (T. Rupert Jones, F.G.S.) Notes on Palæozoic Bivalved Entomostraea, No. 11; Some British and Foreign Species of *Berychia*—with a plate; (Dr. A. Krohn) On the Heart and Circulation in the *Pycnogonidæ*—with a plate; (M. Valenciennes) Abstract of a Monograph of the Family *Gorgonidæ*; (Dr. J. E. Gray, F.R.S., V.P.Z.S.) On the Genus *Assiminia*; (Alfred R. Wallace, F.R.G.S.) On the Law which has regulated the introduction of New Species; (Thomas Wright, M.D., F.R.S.E.) On some new species of *Hemipedinæ* from the Oolites; A short Biographical Notice of the late Dr. Johnston, of Berwick-upon-Tweed. Bibliographical Notices—The British Flora, comprising the Flowering Plants and the Ferns—Seventh Edition. Proceedings of Learned Societies—Royal Society, April 26, 1855, Sir B. Brodie, Bart., V.P., in the Chair; June 14, the Lord Wrottesley, President, in the Chair; June 21, the Lord Wrottesley, President, in the Chair. Linnean Society, January 16, 1855, Thomas Bell, President, in the Chair. Botanical Society of Edinburgh, July 12, 1855, Professor Balfour, President, in the Chair. Zoological Society, April 11, 1854, Dr. Gray, Vice-President, in the Chair; April 25, Dr. Gray, Vice-President, in the Chair. Miscellaneous—Monstrosity of *Antirrhinum majus*; Notice of the Horns and Skull of the Arnee; Meteorological Observations and Table for July, 1855.

QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE. No. 12, April, 1855. Price 4s. With Woodcuts and Lithographic Illustrations. London: S. Highley, 32, Fleet-street.

No. 12, July:—(Wm. Herbert Thomas) Observations on *Cosmarium Margaritifera* and other *Desmidiæ*; Address of the President at the annual meeting of the Microscopical Society, February 28, 1855; (R. J. Farrant, F.R.C.S.) An Account of Mr. Peter's Machine for microscopic writing; (John Frazer) On the Illumination of Objects by polarized light on a dark field; Report of the fifteenth annual meeting of the Microscopical Society. Original Communications—(George Rainey, M.R.C.S., &c., &c.) On the Structure of the Cutaneous Follicles of the Toad, with some experiments and observations upon the nature and alleged venomous properties of their secretion; (F. Currey, M.A.) On the Reproductive Organs of certain Fungi; (Ferguson Branson, M.D.) On Ciliary Action as the cause of the circulation in the Cells of Plants; (F. H. Wenham) Observations on the circulation of the Sap in Leaf Cells of *Anacharis alsinastrum*. Translations—On the Cellulose (in animals) question, by R. Verchow; On the Action of Concen-

trated Solution of Urea upon the wood cells, by A. Kölliker; Notice respecting the occurrence of Lymph-corpuscles in the commencement of the Lymphatic vessels, by A. Kölliker; On the influence of Caustic Alkalies upon the Motions of the Spermatic Filaments, by A. Kölliker; On the Restoration of the Motions of the Spermatozooids of the Mammalia, by MM. Moleschott and J. C. Recchetti; On the Vitality and Development of the Spermatic Filaments, by A. Kölliker. Notes and Correspondence—Reply to some Remarks, by E. H. Wenham; Aperture of Object-glasses in relation to objects in Canada Balsam; Microscopical Conversazioni; Cheap Microscopes; On Species of Diatomaceæ; On a New Locality for Microscopic Test Objects; Memoranda on Flies' feet; On Finders; Memoranda on the Employment of Artificial Sea-water in Marine Aquaria. Proceedings of Societies—Royal Society; Stowe Newington Natural History and Scientific Society, April 24, 1855; Zoophytology. Title-page and Index to the Volume for 1855.

THE ZOOLOGIST. No. 153, July; No. 154, August; No. 155, September, 1855. 8vo. London: J. Van Voorst. 1s. each number.

No. 153, July:—(George Guyon) Singular State of a Living Helops; (Job Johnson) Egg and Larva of Crymodes Templi. Proceedings of Societies—Society of British Entomologists, April 18, 1855, Mr. Harding, President, in the Chair; May 1, Mr. Harding, President, in the Chair. Entomological Society, May 7, 1855, J. Curtis, President, in the Chair; June 4, J. Curtis, President, in the Chair. Notices of New Books—The Annals and Magazine of Natural History, Nos. 89 and 90; The Natural History Review, No. 6; A History of the British Marine Testaceous Mollusca, by W. Clark. Remarkable Act in an Aged Cat; (A. Roberts) Occurrence of the Honey Buzzard near Scarborough; (Edward Newman) Occurrence of the Snowy Owl in Aberdeenshire; (H. Spurr) An Owl laying an Egg after twenty years' confinement; (F. Woodroffe) Ornithology of the Diggings; (E. V. Hareourt) Hen's Egg with Double Shell; (H. Stevenson) Extraordinary Hen's Egg; (G. Grantham) Occurrence of the Little-winged Plover and Smew near Brighton; (T. L. Powys) Occurrence of the Bittern and Goosander in Northamptonshire, of the Red-throated Diver in Plymouth Sound, and of Buonaparte's Gull in Dublin Bay; (E. W. H. Holdsworth) Supposed insensibility of Reptiles to Poison, and on a supposed unnoticed Character in the Fishing Frog; (James Wilson) Salmon and Salmon-fry; (R. H. Meade) Note regarding the Name of the Australian Trap-door Spiders; (W. H. Hawker) *Gonepteryx Rhamni*, double-brooded. This note is an answer to Mr. Newman's doubt as to whether the Brimstone butterfly is double-brooded or not, and answers all his objections in an off-hand way. (T. J. Bold) Capture of *Nomada borealis* at Gosforth, Northumberland; (George Guyon) Tenacity of Life in a *Bembidium*; (W. Thompson) Marine Vivaria; (Rev. H. Clark,) Notes on Certain British *Hydrocantharidæ*. We may here mention that it is the intention of the Rev. H. Clark to publish a Monograph of the British species of "*Hydradephaga* and *Philhydrida*," and that he will be most happy to receive for examination specimens of any doubtful species, more particularly specimens of *Octhebius*, *Hydræna*, *Limnebius*, and *Elmis*; his address being Rev. H. Clark, Northampton. (H. T. Stainton) Entomological Botany, with more especial reference to the plants frequented by the *Tineina*.

No. 154, August:—(R. Knox, M.D.) Inquiries into the Philosophy of the Salmon, and on the Growth of the Salmon from the Egg to the Adult. Proceedings of Societies—Entomological Society, July 2, 1855, John Curtis, President, in the Chair. Proceedings of Natural History Collectors in Foreign Countries—Letter from W. A. R. Wallace, dated Borneo, 8th April, 1855. Mr. Wallace, in writing about the capabilities of St. Munjon coal works as an entomological collecting ground, says—"I here met with the beautiful longicornis of the genera *Astathes*, *Glenea*, and *Clytus*, the elegant *Anthribidæ*; the *Buprestidæ* are very fine; one of the most beautiful is, I think, the *Belionota sumptuosa*, about one inch long, and of the richest golden copper colour; it flies with the greatest rapidity, making a loud, bee-like hum, and settles on timber only in the hottest sunshine." How exciting must be the pursuit of entomology in these tropical climes after the, in this respect, less favoured lands of Britain!

No. 155, September:—(E. H. Rodd) Occurrence of the Honey Buzzard; (H. Stevenson) Occurrence of the Roller; (T. J. Bold) Occurrence of the Pectoral Sandpiper; (G. Norman) Occurrence of large flocks of Crossbills, near Hull; (J. J. Briggs) Note on the Destruction of Swallows by the severity of the Weather; (T. L. Powys) Occurrence of Buonaparte's Gull, on the Irish Coast; Child and Snakes; *Gonepteryx Rhamni* double-brooded? remarks on this subject by H. Doubleday, J. W. Douglas, and H. T. Stainton. This query is here made the subject of several interesting communications from some of the best entomologists in Britain. Mr. Doubleday says the insect is not double-brooded. Messrs. Hawker and Bree say that it is. Mr. Stainton wonders that no one has yet made out such an apparently easy problem; and Mr. Douglas, in our opinion, is the only one who sets about settling the question in a fair and legitimate manner. (S. Price) Occurrence of *Vanessa antiopa* in Wales; (J. S. Ashworth) List of a few rare *Lepidoptera* in Wales; (G. Guyon) Occurrence, at Richmond, Surrey, of a *Coleopterous* Insect, new to Britain; (T. J. Bold) Great abundance of "Clegs" in Cumberland and Northumberland; (E. Newman) Duplicates of the Genus *Colymbetes*; (H. Newman) Enormous Flight of *Ephemera*; (W. Thompson) Short Directions for the Management of Marine Vivaria. Proceedings of Societies—Entomological Society, August 6, 1855, John Curtis, President, in the Chair. Society of British Entomologists, June 5, and July 3, 1855, Mr. Harding, President, in the Chair. Tyneside Naturalists' Field Club Meeting at Bothal. Notices of New Books—Annals and Magazine of Natural History; Artificial Rearing of Salmon, and some of its results; (E. Newman) Memorandum on Dr. Knox's Papers in the last "Zoologist," and on the occurrence of the Spined Loach, near Dorking; The Snake and Child Exhibition; Transactions of Entomological Society of London.

HOOKE'S JOURNAL OF BOTANY, AND KEW GARDEN MISCELLANY. No. 78, July; No. 79, August; No. 80, September, 1855. 8vo. London: Lovell Reeve. Price 2s. each. With a Plate.

No. 78, July:—(R. Spruce) Note on the India-rubber of the Amazon. The mode of obtaining the caouchouc from the various species of *Siphonia*, is almost universally by tapping. Some used to cut down the trees, but found that, in this way, they obtained much less milk than by successive tappings of the same tree, the work, besides, being harder, and causing them to shift their sphere of operations continually. It is dried by smoke, the milk being applied in successive coatings to a mould. In the year 1849, the caouchouc fetched, in the Pará market, only £1 3s. 4d. per 32 lbs. (an arroba), but when the demand began to exceed the supply it reached the very high price of £4 8s. 8d. the arroba; it now sells from £1 15s. to £2. (G. H. K. Thwaites) Description of some new genera and species of Ceylon *Pangiaecæ*; (J. D. Hooker, M.D., F.R.S.) On *Chortodes*, a sub-genus of *Flagellaria*; Extract of a letter from Mr. Wallace, dated Singapore, Oct. 10, 1854. A most interesting letter, giving an account of his ascent of Mount Ophir. (R. Spruce) Botanical Objects sent to the Kew Museum from the Amazon; (G. H. K. Thwaites) On *Urandra*, a new genus of *Olacaceæ*. Botanical Information—Note on *Piassaba*, by T. C. Archer; On *Sarsaparilla*, by W. Spruce. Notices of Books—Carl Müller's *Recensio Generis Grami-*

nearum *Zoysia*, in Mohl, and Schlechtendal's "Botanische Zeitung;" The Phytologist; Loudon's Encyclopedia of Plants; Dr. Cock's *Algarum Fasciculi*; H. Schott, *Arordiæ Fasc.*, I and II.

No. 79, August:—Botany of Van Dieman's Land—Extract of a letter from Dr. Harvey, dated Launceston, Van Dieman's Land, March 31, 1855. Among other interesting particulars given by Dr. Harvey in this letter, he mentions the naturalization of common English weeds in Van Dieman's Land to such an extent as to become perfect pests—horehound is found everywhere, and chamomile covers the fields, in many places to the exclusion of grass. Thistles are fast going a-head, hundreds of acres being given over to them; and they grow so rank in some places that one may walk over the beds of thistle-down, blown from the withered stems, ankle deep. Sweet-briar forms, in some places, impenetrable thickets, and annually produces millions of hips. The furze is, also, spreading, but not so rapidly. Hawthorn and oak trees appear heavily laden with berries and acorns. Botany of Victoria—Extracts of letters from Dr. Mueller. (G. H. K. Thwaites) Note on *Bursinopetalum*; (Dr. Asa Gray) Note on the Development and Structure of the Integuments of the Seed of *Magnolia*; (R. Spruce) Botanical Objects sent to the Kew Museum from the Amazon; (H. H. Calvert) Notes on Vegetable Products sent by him from Erzeroom. Notices of Books—Dr. Hooker and T. Thomson's *Flora Indica*.

No. 80, September:—Notes written on a Voyage from Singapore to Banjer-massing, in the southern extremity of Borneo, in a Letter from James Motley to Sir W. J. Hooker; (G. H. K. Thwaites, F.L.S.) On *Sphragidia* and *Eccremanthus*, two new genera of Ceylon Plants, together with Observations on the Genus *Herni-cyclia*—with two plates; On Botanical Objects communicated to the Kew Museum from the Amazon and its tributaries in 1853, by Richard Spruce; (G. H. K. Thwaites) Notes on the Botany of Ceylon. Botanical Information—Rice Paper Plant; Plants of Greece; Mr. Spruce's Voyage up the Amazon, and its Tributaries; *Cordia Fungi*. Notices of Books—(J. D. Hooker, M.D., F.R.S.) Illustrations of Himalayan Plants; (Thomas Moore, F.L.S.) The Ferns of Great Britain and Ireland, edited by Dr. J. Lindley, nature printed by H. Bradbury; *Chloris Andina*, par Dr. H. A. Wendell.

THE NATURALIST: a Popular Monthly Magazine, with numerous Engravings; conducted by B. R. Morris, Esq., M.D. No. 50, April; No. 51, May; No. 52, June; No. 53, July; No. 54, August; No. 55, September, 1855. 8vo. Price 6d. each. London: Groombridge and Sons.

No. 50, April:—(W.) Notes on the Star-fishes found in the Moray Frith, near Banff; (Edward Parfitt) A List of and Notes on the Fungi found in the Neighbourhood of Exeter; (George Donaldson) The Swamps of the Mississippi; (O. S. Round) The Myrtle Bee. Under this curious title Mr. Round tells us that a Captain Brown, while snipe-shooting, about the year 1830, in some bogs near Egham, met with some birds (?), that by him and his brother sportsmen were called bees. In size these birds (?) were about half as large as a wren; tail, long in proportion to the body, square; plumage(?), sooty gray black; tongue, which *protruded*, was long and horny. This statement of Captain Brown has led to a long discussion in "Notes and Queries;" but for our part we fancy the Captain showed himself a very fair naturalist in calling them bees; for his description comes much nearer a thing belonging to the *insect* tribe than to the *bird* tribe—believing the account to be true. Could the "bee" in question have been the humming-bird sphinx? Flying into the earth, hiding themselves in the moss, buzzing from bush to bush, and concealing in the grass at their roots—such things never were birds. (A. S. Moffat) The Water Ouzel; (C. W. Rothery) Winter Notes at the Lakes. Review—The Entomologists' Annual, 1855; The late Professor Edward Forbes. Proceedings of Societies—Entomological Society of London, January 1, 1855. The Querist; The Wood Pigeon; Increase in Insects.

No. 51, May:—(T. Southwell) A Spring Ramble; (Stephen Stowe) A Glance at the Feathered Residents in, and Visitors to, the Grounds of Terriek House, with

a few remarks from personal observation upon their habits and peculiarities—continued from page 58; (E. M. A.) Notes on the Habits of the Ring Ouzel—*Merula torquata*; (George Donaldson) The Swamps of the Mississippi—concluded from page 85; (H. R. Bolton) On the Expansion and Contraction of British Land Shells. It would appear from Mr. Bolton's observations that a specimen of *Helix aspersa* being taken by him in good condition, and the circumference round the largest whorl measured, the snail then being placed, for twenty days, in a dry situation, that this circumference *decreased* 3-10ths of an inch. This is an interesting subject, and worth the trouble of following up further. Miscellaneous Notices—Occurrence of the Little Auk at Barnsley—*Achillea tormentosa*.

No. 52, June:—(J. G. Baker) Two Days in Wensleydale; (Thomas Edward) The Fishes of Banffshire; (J. M'Intosh) The Redbreast—*Erythaca rubecula*; (J. H. Davies) A List of Land and Fresh-water Mollusca found in the vicinity of Thirsk; (Edward Parfitt) A List of and Notes on the Fungi found in the Neighbourhood of Exeter; (J. M'Intosh) Injurious Insects, No. IV., the Common Wasp—*Vespa vulgaris*; (G. R. Twinn) A Memento from the Tare. Miscellaneous Notices—On the Instinct and Communicative Powers of the Horse; Late Appearance of the Martin; Notes on the Swift Arrival of the Hirundines; Egyptian Goose; Occurrence of the Iceland Gull; Rare Birds near Winchester, and at Redear; The Wolf-fish.

No. 53, July:—(O. A. Moore) Some Account of William Dawson, late of Leeds, Surgeon; Mollusca in the Neighbourhood of Nice, names from Draparnaud—*Mollusques terrestres*; (J. S. Walker) The Myrtle Bee. These few lines do not help to get rid of the "mystery," as we can hardly expect to find New South Wales wrens in Britain. (C. H. Dashwood) Short Notes from my Note-book; (John Rose, M.D.) Nucleus of a Flora of Gosport and adjacent parts of Hampshire; (W. Kidd) The Good Time Coming Come at Last, being notes on recent rambles amidst clouds and sunshine; (Rev. R. Pye Alington) Ornithological Notes. Reviews—Natural History Review; Synopsis of Edible Fishes at the Cape of Good Hope; The Entomologists' Annual; A Classified List of British Mosses; List of British Geodephaga. Miscellaneous—Note on the Rufous Warbler; Ornithological Occurrences in Norfolk; *Papilio machaon*; The Querist; Increase in Insects.

No. 54, August:—(Richard Hobson, M.D.) On the Occurrence of the American Mottled Owl (*Strix asio*) near Leeds. This owl was shot in the spring of 1852, near Kirkstall Abbey, about four miles from Leeds; the species is decided by Mr. Gresham, of York, and Mr. Denny, the Curator of the Leeds Museum, and a figure drawn by the latter individual is attached to this paper. (W.) Stalked-eyed Crustacea of Banffshire; (J. E. Daniel) On the Fauna of Wool, near Wareham, Dorset. We have, in this paper, no less than thirty species of mammalia enumerated as inhabiting part of the forests of Wool. (J. Morley) A Letter to the Editor of the "Naturalist," showing how, in Nottingham, a few operatives have clubbed together into an Entomological Society, and are able to boast of a very fair library, which is yearly increasing. Would we had more of such societies in these countries. (Thomas Edward) An Ornithological Rarity in the North; (J. O. Harper) An Afternoon's Ramble, or a leisure hour. A list of mollusca is appended to these notes, and after every specific name is appended the word "male;" thus (*Cyclas eornea*), male. What can it mean? (George Dixon) New Station for *Leucanora rubra*, *Ach.* (*Lichen ulmi*, *Swarts.*). Review—Kidd on the Canary. Miscellaneous Notices. The Querist.

No. 55, September:—(Richard Hobson, M.D.) Description of a Hawk shot in 1851, on the Chevet Part Estate, by William Bevers, Keeper to the late Sir Thomas Pilkington; (G. B. Clarke) Effects of the severe weather on the Hirundinidæ at Woburn, Bedfordshire, and the neighbourhood; Notes on the Leech, by J. M'Intosh; (J. D.) Land and Fresh-water Shells found in the vicinity of Oxford; (S. Stowe) Ornithological and other Notes; (W.) Contributions to the Ichthyology of Banffshire; (J. J. Briggs) Letter to the Editor of the "Naturalist;" Miscellaneous Notices.

DUBLIN NATURAL HISTORY SOCIETY.

MAY 18, 1855.

Dr. CROKER, M.R.I.A., in the Chair.

After the preliminary business, the Journal of the Geological Society of Dublin, vol. vi., part 2, presented by the Society, was recorded, with other donations.

The thanks of the Society having been given, Mr. Andrews stated that the paper on the list for this evening, "On the plants in the neighbourhood of Sligo, and on the effects of the severe frost," would be deferred until the next evening, as he had received a communication from the Right Hon. John Wynne, saying that he would be able to give a more accurate account of the effects of the frost by waiting a little, as some plants which, at present appear dead, may grow after the rain.

Mr. Gilbert Sanders then gave his paper

ON THE ADVANTAGE TO BOTANY OF LOCAL LISTS, AND NOTES WITH REFERENCE TO THE ALGÆ OF THE EAST COAST OF IRELAND.

As I have not seen a list of marine algæ which have been collected from time to time by various algologists in our bay and the neighbouring shores, I am induced to offer a contribution to the formation of a local list; and I propose that we consider Balbriggan as the northern limit, and Wicklow Head the southern boundary, of what I would beg leave to term the Dublin district of coast. I have selected these two extreme points, on account of their being favourable places for collecting and being so easily accessible by rail, as are also all the intermediate spots along the line of coast. The eastern shores of Ireland, bordering on the Irish Sea and St. George's Channel, have not been sufficiently explored. There is an impression that these shores are not prolific of species. One of our most eminent algologists said to me, about four years since, that the Dublin shores were not favourable for the study of algology, but I think that opinion was incorrect. My friend, Dr. Cocks, of Devonport, spent about two hours at Bray, and a similar time at Howth, in the summer of 1853, and in these two hasty visits he saw upwards of fifty species. Low water, at spring tides, is the most favourable for procuring the rarer species and most perfect specimens. The rock-pools, which are only uncovered at spring-tides, are the best spots for searching, these being the favourite habitats of many scarce algæ. To search these pools satisfactorily, we require considerable light, for without it we cannot see to any depth, or even the sides of the submerged rocks under the shelter of which the more delicate filamentous algæ grow. On the south-western shores of England, and the southern, western, and northern shores of Ireland, and all the shores of Scotland, the time of low water spring-tides is from three hours before noon to three hours after, during which there is sufficient light for collecting; but, unfortunately for algology, in our own immediate district, the same state of tide occurs at six or seven o'clock morning and evening; therefore, the examination of pools, at low water springs, can be conducted on our coast only for about three or four months—viz., the summer—and we are excluded from them altogether during the autumn, winter, and spring, seasons fully as interesting to the algologist as the summer months. The beautiful pencilled tufts of the *sporochnaceæ* are only visible in spring, and many algæ are not in perfection except in winter. Possibly it may be owing to the unsuitableness of the tides that the Dublin coast has the reputation of being unprolific. We can see, however, in the example before us, what may be done by assiduity, by carefully examining what the waves will bring us, especially after storms. When I was able to devote some time to the sea-shore, I found the second or third tide (high water), after the storm ceased, to be the best time for examining the rejectamenta. Marine botany will be much benefitted, if collectors will carefully note every circumstance connected with the abundance of certain plants in particular spots, or seasons, and likewise the changes they may perceive in the forms. The

sportive character of the algæ has led to much dispute—some botanists insisting that certain species of other authors are merely varieties. Doubts of this description will be more surely cleared up by the observations of many observers; and it must also be borne in mind by botanists who are not very familiar with algæ, that many of them put on such variable appearances, according to the season, as to lead to the belief that a summer specimen and a winter specimen of the same plant must be perfectly distinct species. Whilst speaking of the abundance or scarcity of some plants at the usual season of their appearance, I will read an extract from a letter I recently received from Dr. Cocks, which I regard as most interesting, and I look upon it as a very remarkable fact in algology. He says—“I have now had eleven years’ experience in collecting, and have gained a certain amount of practical information, which, I confess, I had heretofore not sufficiently attended to. Observation and experience have taught me that there is not the same regularity in the time of appearance of the marine algæ as there is in plants growing on terra firma, and that the terms annual, biennial, and perennial, are not applicable to the former; and that their growth and time of appearance are governed by laws, or influenced by causes which the algologist, even of the present day, is unable to explain. It is quite true that, in certain localities where I had been in the habit of gathering certain species for two, three, and more years successively, when I have afterwards wanted to obtain more they had disappeared, and, in some instances, have never since been found. In other instances, some plants, which were previously considered to be extremely rare and scarce, only picked up at intervals, far and few between, have suddenly appeared in the greatest profusion. Dr. Budd told me that two years ago, having found out where it grew, he could have dredged thousands of specimens of *Stenogramme interrupta*. Last year I could myself have dredged a like quantity of *Sporochnus pedunculatus* and *Haliseris polypodioides*, neither of which species I ever took before to say plentifully. A few years ago the mud bank at Cremil Passage was strewn over at low water with quantities of *Sphærococcus coronopifolius*, since when I have only taken two specimens. You will, of course, remember when we gathered such a quantity of *Dasya arbuscula* at Firestone Bay. I have carefully hunted over the same ground every year since, and have never seen a single plant; even the very commonest plants sometimes disappear for two, three, or more years—such as *Delesseria hypoglossum*, *D. ruscifolia*, *Nitophyllum punctatum*, &c.” Such is the experience of Dr. Cocks. It would be very desirable for other algologists to note the appearance and disappearance of plants from a locality, and then to endeavour to trace out the cause. With the view of promoting the object of this paper—viz., the preparation of a list of all recorded algæ found on the shores between Balbriggan and Wicklow Head—I suggest that other collectors will look over their collections and give our secretary lists of their gatherings on those shores, that we may have as large a catalogue as possible of the marine botany of the district. I hope soon to increase the list, which, for the present, is confined entirely to Mrs. Davy’s collection; and before concluding I would beg to draw the attention of the members to the very beautiful and natural appearance of the specimens which were prepared after the method laid down in the “Seaweed Collector’s Guide,” by Dr. Cocks, of Devonport.

LIST OF MARINE ALGÆ COLLECTED AT SKERRIES, NEAR THE NORTHERN LIMIT OF THE PROPOSED DUBLIN DISTRICT, IN THE SUMMER OF 1854.

MELANASPERMEÆ.

Order.		Order.	
Fucaceæ.	<i>Cystoseira ericoides</i> .	Dictyotaceæ	<i>Dictyosiphon fœniculaceus</i> .
Sporochnaceæ.	<i>Desmarestia ligulata</i> .	Chordariaceæ.	<i>Chordaria flagelliformis</i> .
„	„ <i>aculeata</i> .	„	<i>Mesogloia virescens</i> .
„	„ <i>viridis</i> .	„	<i>Leathesia tuberiformis</i> .
Laminariaceæ.	<i>Laminaria digitata</i> .	„	<i>Elachista fucicola</i> .
„	„ <i>saccharina</i> .	„	„ <i>scutulata</i> .
„	<i>Chorda filum</i> .	Ectocarpaceæ.	<i>Cladostephus verticillatus</i> .
Dictyotaceæ.	<i>Taonia atomaria</i> .		
„	<i>Dictyota dichotoma</i> .		
„	<i>Stilophora Lyngbyæi</i> .		

Order.		Order.	
Ectocarpaceæ	Cladostephus spongiosus.	Ectocarpacææ	Ectocarpus tomentosus.
"	Sphacelaria scoparia.	"	" littoralis.
"	" cirrhosa.	"	" granulatus.
"	" plumosa.		

RHODOSPERMEÆ.

Rhodomelaceæ.	Rhodomela subfusca.	Rhodymeniaceæ.	Rhodymenia jubata.
"	Bostrychia scorpioides.	"	Sphærococcus coronopifolius.
"	Rytiphlaea thuyoides.	"	Gracilaria confervoides.
"	" fruticulosa.	"	Hypnea purpurascens
"	Polysiphonia urceolata.	Cryptoncmiaceæ.	Gelidium corneum.
"	" formosa.	"	Gigartina mamilliosa.
"	" fibrata.	"	Chondrus crispus.
"	" elongata	"	Phyllophora rubens.
"	" violacea.	"	" Brodiaei.
"	" fibrillosa	"	Gymnogongrus plicatus
"	" Brodiaei	"	Halymenia ligulata.
"	" nigrescens.	"	Ginannia furcellata.
"	" affinis.	"	Iridæa edulis.
"	" atrorubescens.	"	Gloiosiphonia capillaris.
"	" fastigiata	"	Dudresnaia divaricata.
"	" parasitica.	"	Ptilota sericea.
"	" byssoides	Ceramiceæ.	Ceramium rubrum.
"	Dasya coccinea.	"	" botryocarpum.
Laurenciaceæ.	Bonnemaisonia asparagoides.	"	" Deslongchampsii.
"	Laurencia pinnatifida	"	" diaphanum.
"	" obtusa.	"	" echionotum
"	" dasyphylla	"	Griffithsia setacea.
"	Chrysomenia clavellosa.	"	Wrangelia multifida.
"	Chylocladia kalifornis.	"	Callithamnion plumula.
Delesseriaceæ.	Delesseria sanguinea.	"	" cruciatum.
"	" sinuosa.	"	" Turneri.
"	" alata.	"	" tetragonum.
"	" hypoglossum.	"	" tetricum.
"	Nitophyllum lacertum.	"	" roseum.
"	Plocamium coccineum	"	" polyspermum
		"	" corymbosum.
		"	" spongiosum.
		"	" floridulum.
		"	" virgatulum.

CHLOROSPERMEÆ.

Siphonaceæ.	Bryopsis plumosa.	Confervaceæ.	Conferva melagonium.
Confervaceæ.	Cladophora rupestris.	Ulvaceæ.	Enteromorpha intestinalis.
"	" lætevirens	"	" compressa.
"	" albida.	"	" clathrata.
"	" uncialis.	"	Ulva latissima.
"	" glaucescens.	"	

Mr. Andrews said, that the views that had been given by Mr. Sanders were most valuable and interesting, and the reasons were clearly shown why an apparent

dearth of algæ was on the east coast, in comparison with the west or south-west. Zealous local investigators, like what had been shown this evening, would still add much to the list. Mr. Andrews then enumerated many rare specimens that he had obtained on the west coast, which were, at present, completely local there. He had collected very large specimens of *Taonia atomaria*, which he had given, with many others, to his friend, Dr. Harvey—the *Taonia* unfortunately, too late for insertion in his valuable work. *Taonia* is by no means uncommon as a southern plant. *Polysiphonia violacea* is abundantly met at Ferriter's Cove, county Kerry, and specimens of *Dasya ocellata* are found there. *Conferva rectangularis* was found in quantities in Killarney Bay, in the Great Arran Island, and which plant was previously discovered in great abundance on the coast of Connemara, by the indefatigable investigator, the late William M'Calla. Mr. Andrews also mentioned that some years since he had obtained *Microcladia glandulosa*, thrown ashore in the neighbourhood of Dalkey. It was singular, yet true, that seasons much affected the appearance and disappearance of aquatic plants among the algæ and confervæ. In noticing such, in his correspondence with Mr. John Ralfs, of Penzance, author of the "*British Desmidiæ*," and whose communications were always most pleasing, he observes—"I have watched for the last three years many stations of *Mongeotia cærulescens*, *Zygnema curvatum*, various species of *Desmidiæ* and *Vesiculiferae*, and have never found the same species two years in the same pool, nor, indeed, have I seen any of the above plants I found a few years since in the same water. This should teach us to gather a good supply of specimens when we have an opportunity, lest we should not meet with them again."

JUNE 15, 1855.

GILBERT SANDERS, Esq., M.R.I.A., in the Chair.

After the preliminary business, the Secretary said that the donations that had been received would not be submitted until the next meeting of the members, as the rooms were undergoing some improvements, and other arrangements completing.

The Chairman then called for the paper, by the Right Hon. John Wynne,

ON THE EFFECTS OF THE SEVERE FROST ON PLANTS IN THE NEIGHBOURHOOD OF SLIGO.

Mr. Andrews said that he had received a communication from Mr. Wynne, who was unable to attend. Mr. Wynne had forwarded a brief outline of his observations, and mentioned that his avocations left him but little time for natural history. Mr. Andrews then read the following:—

"Having seen an interesting paper, read by Mr. Moore at a meeting of the Dublin Society, on the effects of the late severe frost on the outdoor plants in the Botanic Gardens, at Glasnevin, it struck me that it might interest the members of the Natural History Society to have some information on the effect produced by that frost in the west of Ireland, where the severity of frost is generally so much tempered by the vicinity of the Atlantic Ocean. I, unfortunately, did not possess a self-registering thermometer, so as to give the exact amount of frost here, but I may give some facts which indicated its severity. First—The adjoining lake was frozen across, so as to bear skating for about one-third of its length for about a fortnight—a circumstance which never occurred in my recollection, and I believe only once during the lifetime of my father, who lived to be 85, and spoke of his having once skated across the lake, which we did several times this last season. Secondly—The number of birds killed by it was very great, especially sea birds—curlews and seagulls. After the thaw, the sea-shore was covered with dead sea fowl. However, we can arrive at a tolerable degree of accuracy, as the thermometer, at Markree Observatory, only six miles from this, and equally near the sea, on the 12th of February, stood at 18.2 Fahrenheit, and on the 13th, 17.6; on the 17th, 17.2; on the 18th, 15. There was no snow here during the continuance of the frost—only about two inches fell on the first day of the thaw—so that the plants were exposed to its full severity. Some days after its commencement I had the

roots of most of the plants, upon which I feared its effects, covered with sawdust, but by no means soon enough. In the following list the selection I have made to remark upon as uninjured will probably appear arbitrary, but I made it for the purpose of comparison with those which were mentioned by Mr. Moore as having suffered:—

“Plants killed—*Erica arborea*, *Erica ciliaris*, growing in bog; same, very slightly injured in garden; *Menziesia cærulea*, *Rhododendron altaclarens*, (*Rhod. altaclarens*, which I thought was killed, is now pushing out vigorously.) *Adiantum C. veneris*, from Arran; this has been for years in the rockery, covered during frost with a piece of calico. *Davalliaca nariensis*—all the plants have recovered, even one which had no covering except a fir branch.

“Plants much injured—*Edwardsia tetraptera*, old plants on west wall; *E. microphylla*, old plants on north wall; *Laurus nobilis*, § *Myrtus communis*, on wall, both narrow and broad leaved; *Ulex Europæus*, in some places, not the least in others; *Calluna vulgaris*, in bog; § *Abutilon striatum*, on east wall, out four or five years; § *Menziesia polifolia*, *Verbena tryphilla*, § *Aspidum longifolium*, covered with calico.

“Slightly injured as to the leaves—*Arbutus unedo*, much injured a few miles off; *Photinia serrulata*, both on wall and stand, and very slightly; *Viburnum tinus*, some plants, close to bays which were much injured, received no injury; § *Cenothus azureus*, on south wall.

“Uninjured—*Fuschia globosa major*, on east wall; *Magnolia grandiflora*, on south wall; *M. Tripetala*, standard; *Rhododendron Arboreum*, *R. chamænstus*, *Arbutus Andrachne*, *Olea excelsa*, Standard, sheltered; *Daphne pontica*, *Pæonia montana*, *Paulonia imperialis*, *Erica Mediterranea*, *E. ditto*, Irish variety; *Cedrus deodara*, *Aurancaria imbricata*, *Cupressus tomentosa*, *Taxodium sempervirens*, *Pinus Canariensis*, *Abies Webbiana*, *A. Cephalonica*, *Cryptomeria Japonica*, *Quercus coccifera*, *Juniperus Bermudiana*, *Buddlæa globosa*, *Cistus ladaniferus*, *Garrya eliptica*, *Woodwardia radicans* (S), covered with calico, as it has been for some years; *Trichomanes brivesetum*, *Pinguicula grandiflora*, *Anemothera cruenta*, *Mimulus moschatus*. I forgot *Aponogeton distachyum*, which I only got last summer, and which is quite uninjured, though the water in the reservoir in the garden in which it was placed was entirely frozen.”

Mr. Andrews said that he was sure the members would feel much indebted to Mr. Wynne for this communication, which was valuable for the notices of those trees, shrubs, and plants that withstood the severity of such a winter, and especially as the plants had been completely unprotected by the sheltering covering of snow. The comparison was also of interest with the records of those effects on the east coast, as shown in the paper given by Mr. Moore. The grounds of Hazlewood are among the most beautiful in the country, and many parts of Mr. Wynne's extensive demesne bear striking evidence of the complete success of the planting and of the beautifying of apparently most unproductive wastes, and prove what judgment and perseverance can effect. Bordering the demesne was once a wild tract of bog, covered only with the common heaths, coarse grasses, and with juncaceæ and cyperaceæ peculiar to the wet and spongy soil of such uncultivated wastes. Subsequently the growth of belts of pines skirted numerous enclosures, drains, broad paths, and vistas were formed, and this paradise bloomed with the most beautiful heaths, azalea, and rhododendra. Binding the embankments thrown up from the deeply-cut drains, the varieties of berberry, holly, *Mahonia aquifolium*, *repens*, and *fascicularis* grew with rapidity and luxuriance, throwing out innumerable suckers, and which, gaining strength of growth, again sent out their branchlets in all directions. Among the Rosaceæ, *Rosa arvensis* and many of the ornamental briars grew on the sunny slopes of the peat embankment with great beauty. The sides of the once desolate valley of Glen Car, and which were exposed to the furious and sweeping gusts of the north-west gales, are now clothed and tinged with the fine growth and the varied hues of the larch, the pinaster, black Austrian pine, and the stone pine. The judicious planting of the Austrian pine has proved a sheltering screen to the fair growth of the rest. The *Pinus Austriacus*,

Those marked § were covered with sawdust.

peculiar to the Briema Forest, in the Austrian States, is a valuable tree, serving as a shelter, and enduring exposure to the storms of the coast better than the pinaster or sycamore, and of all the pines it bears transplanting with the least injury to its growth. These improvements have been carried on extensively on each side of Lough Gill—a lake five miles in length, and, in parts, nearly two in breadth, and, with its islands, beautiful in its scenery. This lake, Mr. Wynne observes, was frozen over during the severity of the past winter; its waters are only twenty feet above the sea. The silver firs are among the finest in the kingdom, exceeding 90 feet in height, and, at a few feet from the ground, eleven and twelve in girth. Sixty to seventy of these fine trees were blown down in the storm of the 6th of January, 1839; one of the trees, thirteen feet in girth, boarded a loft 40 feet by 20. The Chichester elm grows well, and becomes a fine tree, and the Turkey oak has a most rapid growth, and bears the wind well, but the white American spruce appears the best suited for high grounds, and to stand exposure to storms. The rockery in the gardens exhibits, in all their vigour of growth, some of the choicest plants and ferns of the mountains of Switzerland, and there also *Pteris longifolia*, a West Indian plant; *Trichomanes radicans*, and *Adiantum capillus veneris* bear the open ground throughout the seasons. Mr. Wynne informs me that the *Trichomanes* flourishes luxuriantly in his Wardian ease, but does not bear involucra; on the rockery it fruits most freely. The *Pinguicula grandiflora* blooms there with surprising beauty and profusion. The influence of temperature has always affected the phenomena of vegetation, and we find plants, natives of opposite spheres, enduring, in many instances, degrees of temperature, either of heat or of cold, if that temperature be even, and not subject to sudden changes or transitions. Those plants, trees, or shrubs that suspend their powers during the winter, bear, without injury, the utmost rigour of that season, whilst those, like the sweet-bay (*Laurus nobilis*), *Laurustinus*, and shrubs of similar habits, that have greater or less vitality during the winter months, suffer most extensively. At Glazenwood nursery, when remarking on the extensive ravages caused by the frost of 1837-38, Mr. Curtis says, “I have never known a more mischievous winter. Amongst standard roses I observe that a great many that were moved in the months of October and November survived, whilst those unmoved, of the same kinds, perished from the fulness of their sap-vessels.” In looking over Mr. Wynne’s list, I find that amongst the plants that were altogether killed, or much injured, were heaths, myrtles, old plants of the species of *Edwardsia* and the *Laurus nobilis*; while, among those that were uninjured, were *Pæonia montana*, *Cedrus deodara*, *Araucaria imbricata*, *Trichomanes radicans*, and the *Rhododendron*, and pines generally. In my own fernery, which is enclosed in a small greenhouse, the *Trichomanes* did not in the least suffer, although the fronds were coated with ice the greater part of the period the frost lasted—neither did *Adiantum capillus veneris*, nor the species of *Hymenophyllum*. I have particularly noticed, in Mr. Wynne’s list, the *Cedrus deodara* and *Araucaria*; for, in reviewing the records of the severe frost of the winter of 1837-38, those plants were invariably found to stand the severity of the season, while, in all instances, the destruction to the *Laurus nobilis*, or sweet bay tree, appeared to be general. These notices are from the principal gardens in England and Scotland. The manager of the gardens and Pinetum at Dropmore states—“*Araucaria imbricata*—plants of this species, though not protected, and growing in exposed situations, have scarcely suffered, and the whole of the trees are growing vigorously. *Cedrus deodara* proves to be quite hardy. The *Laurustinus*, bay trees, and the heaths, *Erica Mediterranea*, *australis*, *arborea*, and *vagans* were killed to the ground, but are now growing freely. I fully expected all were dead, as they were very late before they broke—Dropmore, 12th September, 1838. Time should be given to valuable plants, apparently dead. The most severe frost of the winter was the middle of January, 1838.” In the island of Jersey the coldest day was on the 19th, when Fahrenheit’s thermometer, at five o’clock, p.m., was 18; on the 17th of the same month, it was noted, at the Nursery in Kilkenny, that Fahrenheit’s thermometer fell to 20. The magnolia, both in England and on the Continent, suffered but little injury; while the pines, heaths, and rhododendron, extensively perished. A friend informs me that, at the gardens at Cronstadt, St. Petersburg, and Moscow, at the approach of winter, all

plants and vegetables are packed away, stored, and sheltered, and throughout the winter the gardens present dreary scenes of desolation. At the end of April the thaw hurries all into arrangement; and, with the vigour of the sun, vegetation bursts forth like a thought; and, during the few months of summer, the gardens are as gay as those in the neighbourhood of London. The severity of a winter influences a corresponding heat in the ensuing summer, and from the observations made by Mr. Erman (Humboldt, *Asie centrale*), such severe winters are followed by warm and dry summers. M. L. C. Seitz, Royal Court and Botanic Gardener at Munich, remarks in the "*Garten Zeitung*," for August, 1838, with reference to the severity of the winter of 1837-38—"We experienced an almost insupportable heat during the months of June and July, when the thermometer continually varied between 23 degs. and 25 degs. of Reamur (80 degs. to 85 degs. Fahrenheit). On the 15th of July, at two o'clock in the afternoon, it was 26—25 degs. Reamur (90 degs. Fahrenheit)."

Mr. Callwell observed that in his large fernery he had noted, within the house, the thermometer to fall to 18 degs. Neither *Trichomanes* nor *Adiantum capillus veneris* suffered in the least. He attributed this to the temperature being in some degree uniform, and to the stillness of the atmosphere.

Observations followed from the Chairman, Mr. Bain, and other members.

Mr. Andrews exhibited specimens of the Natterjack toad (*Bufo calamita*), in a lively and healthy state. They had buried themselves throughout the winter under some saxifrages in his garden, and appeared early in May. They were brought from the County of Kerry last summer.

The Chairman remarked that as Mr. Ffennell was not present to give his paper "On the Salmon, and on peculiarities with regard to the Young State," he wished to know if the members had any other subject to discuss?

Mr. Andrews said that Mr. Ffennell had recently mentioned to him that his paper was prepared, and that he had some important facts to communicate relative to the descent of the salmon fry to the sea, at a very early period of this year.

As Mr. Ffennell was absent, probably upon public business, Mr. Williams had requested Mr. Andrews to make some remarks on specimens of the Parr, which he had that morning received from the Bandon River.

Mr. Andrews then said, that a statement, made more than five years since in this Society, by Mr. Williams, may be in the recollection of several of the members, on the distinctive habits of the little fish known as the Parr (*Salmo salmulus*) from that of the true salmon fry, and with regard to the rivers and localities where that little fish existed. Discussions upon this subject were at several subsequent sessions of the Society continued. These led to the paper that I gave upon the subject, at the meeting of the 16th of June last year, 1854. I should premise, Mr. Chairman, by stating, that the majority of opinions were in opposition to the views given in that paper, those opinions being in support of the presumed successful experiments made by Mr. John Shaw, of Drumlanrig, and published in 1840, the results of his several communications read before the Royal Society of Edinburgh. Mr. Shaw and his numerous adherents maintained, until very recently, that the fry, the produce of the ova of the salmon, remained two years in the fresh water, in the state called the parr, before it assumed the smolt transition, and descended to the sea. There were other points advanced by him, such as the early breeding development of the male parr. Having formerly been resident for several years in the western parts of Ireland, and in all seasons practically fishing some of the best salmon and trout rivers in that country, and in companionship with some of the most experienced salmon fishers, and latterly having turned my observations to the science of the subject, I felt that I might, with some confidence, detail the views that I had formed in the paper given by me twelve months since. The principal points were, that the salmon fry assumed the smolt or migratory state, and descended to the sea, from eleven to fourteen months after extrication from the ova—that is, the young fish hatched and liberated from the ova in the month of April, 1854, would assume the smolt state at the same period, or a month later, and descend to the sea, in 1855. That fish, described as the parr, would be found in rivers, throughout the seasons, of good size, and after the salmon-fry, as smolts had descended to the sea. There were parr similar in markings to the salmon-fry,

but distinct in habits. At the time I advanced these views, I was not aware of the extent to which Mr. Andrew Young, of Invershin, manager of the Duke of Sutherland's salmon fisheries, had carried his experiments, nor of the writings of "Ephemera," of *Bell's Life*. I have read their works, and in which sound practical observations and masterly judgment of the subject appear throughout. Fortunately for practical knowledge and for science, a well-organized series of experiments were arranged, and the grounds adopted for the operations were the Stormontfield ponds, on the banks of the Tay, and these were skilfully managed by Mr. Buist and others, of Perth. A rather early investigation into the subject this year, led Mr. Wilson, a naturalist, of Edinburgh, and backed by several savans, to at once adopt and laud Mr. Shaw's theories, and to promulgate such decision, to the vast importance of the national fisheries. These were published by the Perthshire papers and the excellent editor of the *Scotsman*, in support of Messrs. Shaw, Wilson, &c. But, lo! in a little time, the ponds glittered with silver, the little fish congregated, and an intelligent writer thus communicates to me the transition—"The fry in the Perth ponds are all liberated—they would not stop another year, but threw themselves by scores on the banks, to escape imprisonment. Thus has passed the glory of Shaw and his followers." And this I may say, has confirmed the sagacity of Andrew Young and "Ephemera."

Mr. Andrews then exhibited and made remarks on some fresh specimens of parr, taken two days since from the Bandon river, smolts taken from the Laune river, county Kerry, early in May, and the true salmon-fry, taken October last. The parr were of good size, and, from inquiries, not a single salmon-fry could be obtained this month from the Laune, the Caragh, or the Bandon rivers. They had all gone to the sea.

Mr. Andrews said that he had examined many of the smolts, or true salmon-fry, and could never detect the milt or the ova but in a rudimentary state. He would take another opportunity of making more full remarks upon the subject, and have a series of specimens present.

Mr. Williams said he wished to have recorded in the Society the occurrence of the turtle-dove (*Columba turtur*), seen in a potato field, between Howth and Baldoyle, on the 9th of July last.

Dr. Farran mentioned its occurrence in Carrick-on-Suir, in September last; Mr. Montgomery noticed its having been obtained in Donegal; and the Chairman observed that he had seen a recent specimen, which was yesterday shot in the neighbourhood of Castleknock.

Mr. Andrews recorded the breeding of the scaup-duck, the nest, eggs, and the old bird having been obtained in an inland lake, in the western parts of Kerry. Fine specimens of the red-breasted merganser were also obtained, which inclined him to believe that that bird also bred there.

Dr. Farran exhibited a beautiful specimen of the *Larus ridibundus* in its adult and most perfect plumage.

Mr. Andrews observed that this beautiful bird, which was shot at Edenderry, was in its fourth change, and most perfect state of plumage. The head had assumed the dark hood, the back and wing coverts had lost the markings, and were of an uniform pearl-gray colour, and the dark bar or band on the tail had disappeared, the tail having become pure white. At the approach of the breeding season the feathers of the head became of a dark colour, forming a kind of hood or mask; and this change was caused, not by a process of moulting, but by an alteration of colour. The autumnal moulting changed the colour of the plumage, the black hood disappeared, and the head was perfectly white through the winter months.

Dr. Carte made some excellent observations on the extravascular nature of feathers, and of the influences of vitality which affect the changes of colour. It is hoped that a paper upon that subject will be given by Dr. Carte.

The Secretary stated that as this meeting closed the session, it was the intention to hold the annual dinner of the Society as early as possible after it. Circulars, therefore, would be sent to the members, informing them of the time and place the annual dinner would be held.

The Chairman then adjourned the meeting to the second Friday in November next.

DESCRIPTIONS OF PLATES.

PLATE 1—VOL. II.

FIGURES OF SPHÆRIA ——? ILLUSTRATING MR. E. PERCIVAL
WRIGHT'S PAPER ON FUNGI PARASITIC ON INSECTS.

1. Sphæria ——? attached to Lepidopterous Larva, taken near Dublin,
1853 ; immature.
2. Sphæria ——? attached to Lepidopterous Larva ; reared, but without
fructification.
3. Sphæria ——? attached to Lepidopterous Pupa ; also reared, but
without fructification.

All the figures are of the natural size.

Vide Proceedings of Societies, page 55.

PLATE 2—VOL. II.

PARTIAL FIGURES OF INSECTS, ILLUSTRATIVE OF A PAPER
BY MR. HALIDAY ON THE FAUNA OF KERRY.

1. *Heptamelus ochroleucus*. *Steph.*
2. *Blasticotoma filiceti*. *Klug.*
3. *Dipsocoris alienus*. *H. Schaeff.*
4. *Clunio marinus*. *n. sp.*
5. *Rhaphium flavicolle*. *Mg.*
6. *Dolichopus prætextatus*. *n. sp.*
7. *Aphrosylus celtiber*. *n. sp.*
8. „ *raptor*. *Ins. Br.*
9. „ *ferox*. *Ins. Br.*
10. *Geomyza cingulata*. *n. sp.*
11. *Canace nasica*. *Hal.*
12. *Glenanthe ripicola*. *Hal.*

Vide Proceedings of Societies, page 59.

PLATE 2*—VOL. II.

POLYPRION CERNIUM, ILLUSTRATIVE OF MR. ANDREWS'S
PAPER ON THE PERCIDÆ AND SERRANI.

Vide Proceedings of Societies, page 36.

PLATE 3—VOL. II.

FIGURES OF INSECTS, ILLUSTRATIVE OF MR. HALIDAY'S PAPER
ON NEW OR LITTLE KNOWN INSECTS.

1. *Ochthebius rufomarginatus*.
2. *Cercyon depressum*.—C. Head.— \ominus .[`] Lateral outline of Prothorax.—
T.[`] Fore Tibia with tarsus.—K. Mesosternum and Metasternum.
3. *Ochthebius punctatus*, Larva.—B. Antenna.—M.[`] Mandibula.—M.
Maxilla.—L.[`] Labrum.—L. Labium.—P.^{``} Labian Palpus.
4. *Diglossa mersa*, Larva ; like references.
5. *Ptilium coarctatum*.
6. *Ptilium clandestinum*.
7. *Trichopteryx mollis*.—B. Antenna. g. Underside of Prothorax with
Abdomen.

Vide Proceedings of Societies, page 116.

PLATE 4—VOL. II.

ELACHISTA TRISERIATELLA.

1. The natural size.
2. Magnified.

Vide Proceedings of Societies, pages 116–124, and pages 109–115.

The remaining figures to illustrate Mr. Haliday's paper on *Pulex*, not in time for the Proceedings of this No. ; see the No. for January, 1856.

3. Larva—slightly magnified.
4. Do.—more magnified.
5. Rachidian chain.
6. Two-niter mediate ganglia.
7. Intestinal canal, with head.
- 8-9. Rudiments of generative system.
10. Head—side view.
13. Do.—from above.
14. Antenna.
11. Epistoma—from above.
12. Fore part of head—from below.
15. Mandibles closed, &c.
16. Palpus under mandible.
17. Palpus detached.
18. Mandibles extracted.
19. Intermediate segment of above.
20. Do.—side view.
21. Hinder part of body.
22. Upper edge of anal declivity.
23. Terminal hooks from below.
24. Intestinal canal.
25. Grapplers of male.
26. Internal organs do.
27. Vesicles apart.
28. Ovident and ovary of female.





